Annual Compilation and Analysis of Hydrologic Data for Urban Studies in the Austin, Texas Metropolitan Area, 1971

U. S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Prepared in cooperation with the Texas Water Development Board

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By F.H. Tovar

U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
Texas District Open-File Report
I.D. Yost, District Chief

Prepared in cooperation with the Texas Water Development Board

May 1973

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By

F. H. Tovar

INTRODUCTION

The U.S. Geological Survey, in cooperation with the Texas Water Development Board, began hydrologic studies in the Austin urban area in 1954. The objectives of this project are as follows:

1. To determine the effects of progressive urbanization on infiltration, rates of peak discharge, and rainfall-runoff relations in the Waller Creek watershed.

2. To provide rainfall-and-runoff data from the rural Wilbarger Creek watershed to be used for comparative purposes in determining the effects of existing and progressive urbanization in the Waller Creek watershed.

3. To provide applied research facilities for studies at the University of Texas at Austin.

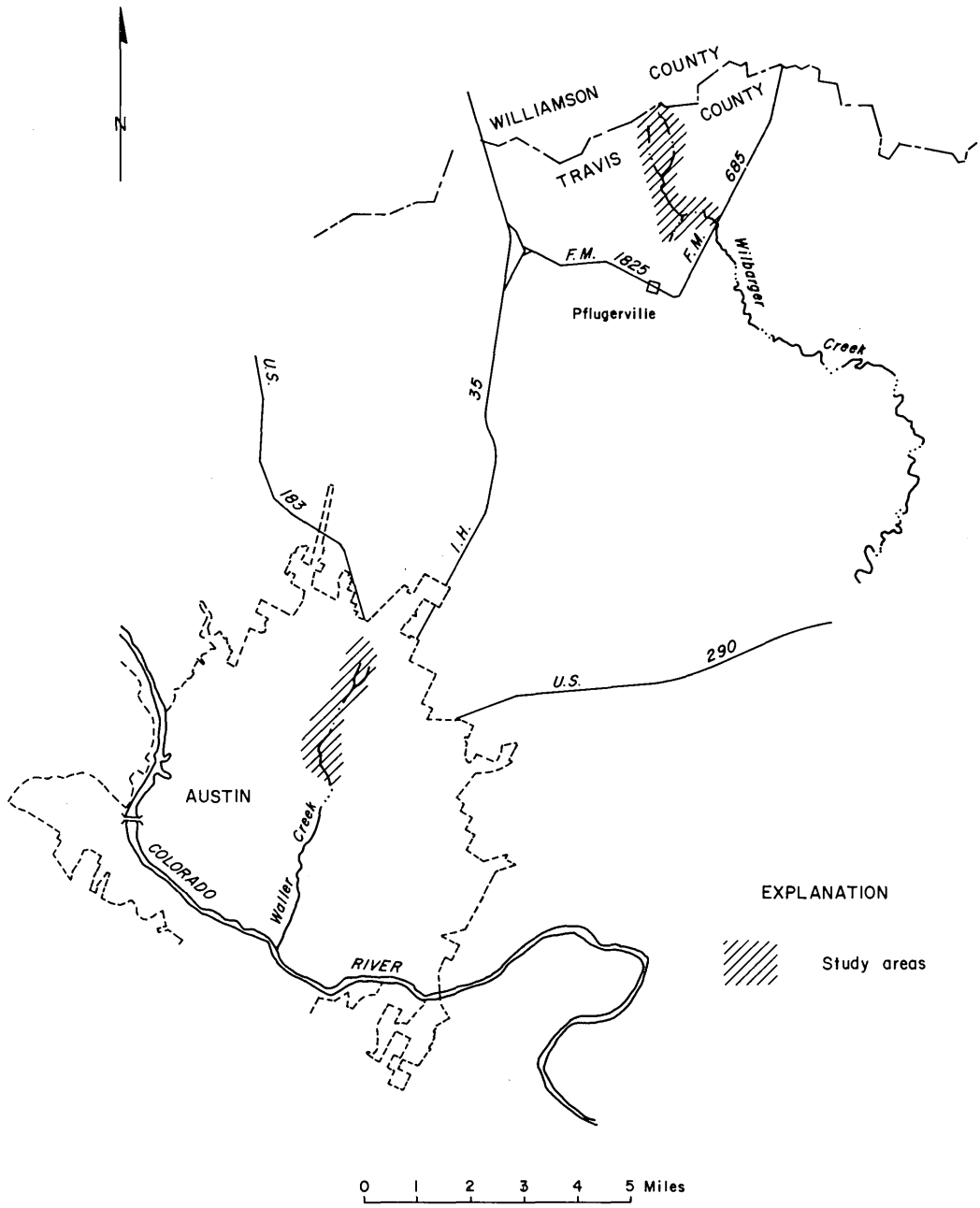
The purpose of this report is to present rainfall-and-runoff data for the Waller Creek and Wilbarger Creek study areas for the 1971 water year (October 1, 1970, to September 30, 1971).

To facilitate the publication and distribution of this report at the earliest feasible time, certain material has been inluded that does not conform to the formal publication standards of the U.S. Geological Survey.

WATERSHED FEATURES

Waller Creek Study Area

The Waller Creek drainage area (fig. 1) lies entirely within the city of Austin, with the headwaters originating in the northern part of the city. The creek flows south for 6.6 miles to the Colorado River. Storm sewers and street gutters divert runoff both into and out of the natural drainage area.



Base from General Highway Map of Texas

FIGURE 1.-Location of Waller Creek and Wilbarger Creek study areas

Throughout the year, low flow is partially sustained by return flow of city water from industrial and residential users. Low flow during the summer months is partly sustained by drainage from municipal and private swimming pools.

In 1954, 20.6 percent of the drainage area above 23d Street was impervious cover, i.e., streets, sidewalks, roofs, etc; this cover had increased to 28.6 percent by 1962 and to 35.2 percent by 1966. Impervious cover in the drainage area above 38th Street increased from 13 percent in 1954 to 21 percent in 1962 and to 33.3 percent in 1966. Soil in the watershed is predominantly clay, which is underlain by Cretaceous chalk that crops out along most of the channel.

The slope index for Waller Creek is 48.6 feet per mile at 38th Street and 47.3 feet per mile at 23d Street. These indices were computed by determining the difference in elevation between the two points that were 85 and 10 percent of the main channel distance upstream from the gaging station, and then dividing by the distance between the two points.

Mean annual rainfall (based on the period 1931-60) at the National Weather Service station, approximately 1.5 miles east of the watershed, is 32.58 inches. Rainfall is generally well distributed throughout the year; however, individual storms may cause serious flooding in any season. The major storms usually occur during the months of April-May and September-October.

Wilbarger Creek Study Area

The headwaters of Wilbarger Creek originate in Travis County near the Williamson County line (fig. 1). The creek flows southeasterly about 40 miles to the Colorado River. The Wilbarger Creek study area is about 15 miles north of the city of Austin.

The soil in the watershed is predominantly clay, which is underlain by Cretaceous chalk that crops out at many places along the channel. The principal land use is farming and ranching.

The slope index, calculated by the 85-10 percent method, is 39.2 feet per mile. Runoff characteristics are slightly affected by farming practices, stock tanks, and vegetation.

HYDROLOGIC INSTRUMENTS

Waller Creek Study Area

Instruments to collect rainfall-and-runoff data in the Waller Creek study area consist of a network of three recording and three nonrecording rain gages and two stream-gaging stations. Figure 2 shows the locations of instruments in the study area.

The rain gages are distributed in the study area to measure the total rainfall and to define rainfall intensities on the watershed.

One stream-gaging station is maintained at 38th Street and the other at 23d Street. Low-water concrete controls were constructed at each stream-gaging station to stabilize the stage-discharge relationship. Records at the 38th Street station began April 5, 1955, and at the 23d Street station on December 23, 1954. Pertinent station information and records of daily, monthly, and yearly runoff for the 1971 water year for both stations are included in the section "Compilation and Analysis of Data".

Wilbarger Creek Study Area

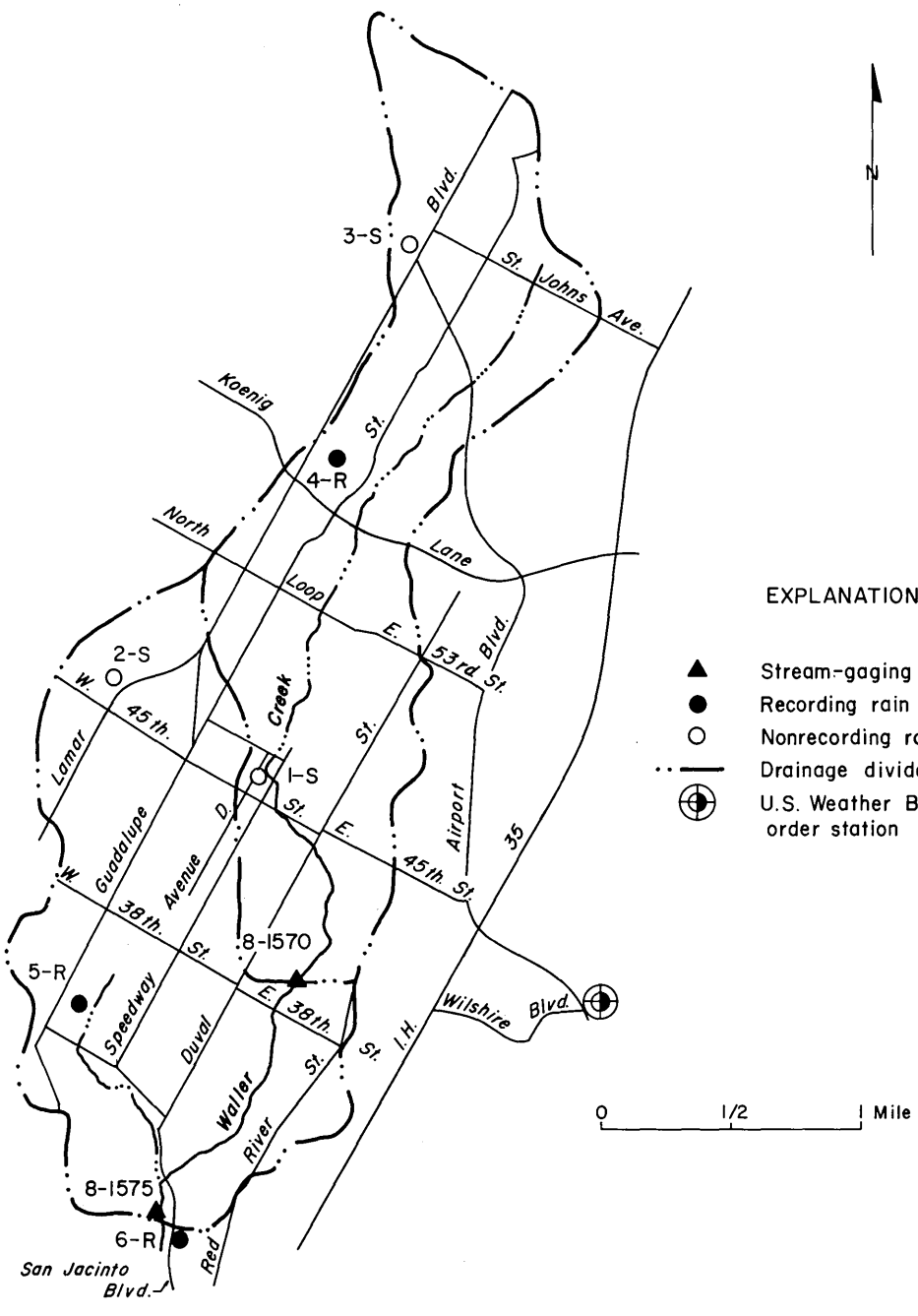
Instruments to collect rainfall-and-runoff data in the Wilbarger Creek study area consist of a network of three recording rain gages and one stream-gaging station. Figure 3 shows the locations of instruments in the study area.

The rain gages are distributed in the study area to measure the total rainfall and to define rainfall intensities on the watershed.

A continuous-recording stream-gaging station equipped with a concrete low-water control is maintained on Wilbarger Creek. Records at this station began August 9, 1963. Pertinent station information and records of daily, monthly, and yearly runoff for the 1971 water year are included in the section "Compilation and Analysis of Data".

SUMMARY OF DATA FOR WALLER CREEK, 1971 WATER YEAR

The weighted-mean rainfall in the study area upstream from 38th Street was 22.66 inches, 30 percent below the mean annual rainfall for Austin of 32.58 inches. Mean daily discharge was 0.96 cfs (cubic feet per second); annual runoff was 5.63 inches, or 25 percent of rainfall.



Base from General Highway Map of Texas

FIGURE 2.-- Locations of hydrologic-instrument installations in the Waller Creek study area

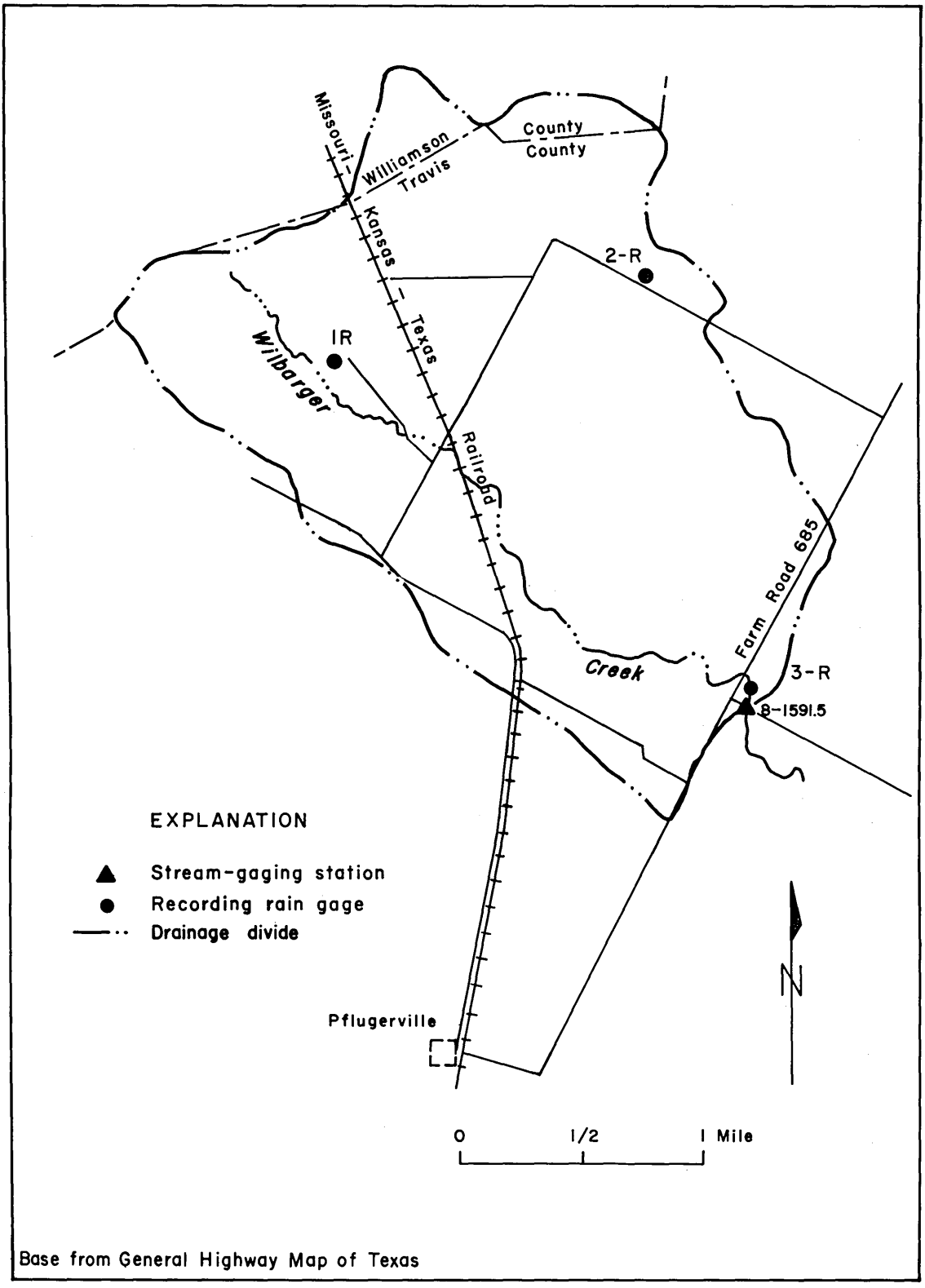


FIGURE 3.-- Locations of hydrologic-instrument installations in the Wilbarger Creek study area

The weighted-mean rainfall in the study area upstream from 23d Street was 22.64 inches, 31 percent below the mean annual rainfall for Austin. Mean daily discharge was 2.43 cfs; annual runoff was 7.98 inches, or 35 percent of rainfall.

A storm event is defined as a period of rainfall separated by at least 6 hours from other rainfall. Storms are selected for detailed rainfall-runoff computations on the basis of rainfall totals and distribution, the peak discharge produced from the rainfall, and the assurance of good rainfall and runoff records for the storm periods selected.

Four storm periods, June 21, July 26-27, August 2, and 3-4, were selected for analysis. A summary of rainfall-runoff data for each storm is shown in table 1. Computations with hydrograph and mass curves for each storm are included in the section "Compilation and Analysis of Data".

SUMMARY OF DATA FOR WILBARGER CREEK, 1971 WATER YEAR

Weighted-mean rainfall in the study area was 18.31 inches, 44 percent below the mean annual rainfall for Austin. Mean daily discharge was 0.25 cfs; annual runoff was 0.73 inches, or 4 percent of rainfall.

One storm period, October 22-23, 1970, was selected for analysis. A summary of rainfall-runoff data for each storm is shown in table 1. Computations with hydrograph and mass curves for each storm are included in the section "Compilation and Analysis of Data".

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 1.--Storm rainfall-runoff data, 1971 water year.

Date of Storm	Rainfall (inches)					Runoff (inches)	Ratio runoff to rainfall	Maximum discharge (cfs)
	Duration (hours)	Total	Maximum increment					
			15-minute	30-minute	60-minute			
Waller Creek at 38th Street, Austin, Tex. (Drainage area, 2.31 sq mi)								
June 21, 1971	3.5	1.81	0.79	1.18	1.53	0.32	0.18	290
July 26-27, 1971	8.4	1.31	.50	.72	1.04	.21	.16	154
August 2, 1971	9.8	1.27	.41	.53	.60	.34	.27	165
August 3-4, 1971	31.2	4.37	.46	.71	.92	1.15	.26	587
Waller Creek at 23d Street, Austin, Tex. (Drainage area, 4.13 sq mi)								
June 21, 1971	3.5	2.03	0.72	1.25	1.72	0.55	0.27	1,560
July 26-27, 1971	8.5	1.63	.46	.76	1.28	.40	.25	900
August 2-4, 1971	51.9	5.08	.40	.56	.85	1.44	.28	805

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UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 1.--Storm rainfall-runoff data, 1971 water year.

Date of Storm	Rainfall (inches)					Runoff (inches)	Ratio runoff to rainfall	Maximum discharge (cfs)
	Duration (hours)	Total	Maximum increment					
			15-minute	30-minute	60-minute			
Wilbarger Creek near Pflugerville, Tex. (Drainage area, 4.61 sq mi)								
Oct. 22-23, 1970	15.2	3.25	.77	1.25	1.55	.53	.16	611

08157000 Waller Creek at 38th Street, Austin, Tex.

LOCATION.--Lat 30°17'49", long 97°43'36", Travis County, on right bank 200 ft upstream from bridge at East 38th Street in Austin, 1.1 miles upstream from West Branch of Waller Creek, and 3.3 miles upstream from Colorado River.

DRAINAGE AREA.--2.31 sq mi.

PERIOD OF RECORD.--April 1955 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 555.44 ft above mean sea level.

AVERAGE DISCHARGE.--16 years, 1.66 cfs (9.76 inches per year, 1,200 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 587 cfs Aug. 4 (gage height, 5.68 ft); minimum daily, 0.06 cfs Sept. 9.
Period of record: Maximum discharge, 1,970 cfs Oct. 29, 1960 (gage height, 7.77 ft); no flow for many days in 1955-57, 1964.

REMARKS.--Records good. Flow slightly regulated at times by a small reservoir at Holy Cross High School (formerly St. Mary's Academy) on East 41st Street and a small swimming pool at the School which is drained into the creek every week or two during the summer. Water from other swimming pools also drain into the creek. Station is part of hydrologic research project to study rainfall-runoff relation for small urban areas. Two recording and three nonrecording rain gages are distributed in the area so that rainfall on the watershed can be determined.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	.25	.25	.20	.22	.23	.20	.15	.11	.40	.33	.11
2	.19	.25	.22	.22	.22	.49	.20	.15	.09	.71	21	.09
3	.19	.26	.22	.22	.23	.24	.22	.17	.08	.38	25	.09
4	.19	.24	.22	.25	.26	.22	.21	.12	.26	.32	46	.09
5	7.0	.25	.23	.25	.29	.22	.19	.13	.49	.25	5.0	.11
6	.34	.25	.23	.24	.24	.20	.19	1.4	.40	.27	3.5	.07
7	.24	.26	.21	.24	.19	.23	.18	.17	.29	.61	1.1	.07
8	.20	.25	.21	.25	.23	.21	.18	.14	.19	.37	.64	.07
9	.18	.31	.23	.23	.24	.22	.17	.15	.42	.33	.50	.06
10	.19	.34	.23	.20	.24	.22	.17	.15	.45	.22	.34	5.9
11	.24	.31	.22	.21	.24	.22	.14	2.3	.57	.23	.51	1.8
12	.41	.25	.22	.27	.21	4.3	.16	.19	.37	.23	.47	.13
13	.28	.28	.24	.25	.26	.46	.16	.14	.36	.23	.29	.11
14	.20	.25	.22	.24	.29	.23	.19	.19	.31	.25	.47	.10
15	.19	.24	.22	.22	.22	.24	.20	.13	.18	.45	.23	5.9
16	.19	.25	.23	.22	.21	.25	9.3	.16	.31	.36	.41	.26
17	.19	.23	.22	.22	.21	.23	.39	.19	.43	.34	.29	.14
18	1.7	.36	.20	.21	.21	.23	.22	.14	.37	.34	.49	.13
19	5.8	.24	.21	.21	3.0	.21	.22	.08	.36	.26	.45	.37
20	.25	.29	.27	.22	.22	.25	.24	.11	.19	.30	.46	.24
21	.24	.24	.23	.23	.20	.25	.19	.11	20	.39	.49	.21
22	23	.23	.22	.23	.19	.25	.17	.11	.40	.37	.44	11
23	26	.22	.25	.23	.21	.21	.16	.10	.39	.29	.38	.17
24	.55	.22	.22	.21	.20	.22	.16	8.6	.42	.17	.21	.15
25	.29	.21	.20	.22	4.2	.25	.16	.15	.40	.34	.39	.14
26	.28	.22	.24	.21	.83	.25	.26	.11	.23	8.1	.73	.13
27	5.5	.26	.22	.21	.24	.30	.47	.11	.34	4.8	.44	.29
28	.34	.28	.22	.27	.24	.24	.17	.11	.69	.45	.42	.13
29	.32	.22	.21	.25	------	.22	.16	.10	.64	.39	2.0	.11
30	.66	.22	.22	.22	------	.22	.15	.10	.41	.78	.81	.10
31	.27	------	.21	.21	------	.22	------	.11	------	.15	.16	------
TOTAL	75.82	7.68	6.94	7.06	13.74	11.73	15.18	16.07	30.15	23.08	113.95	28.27
MEAN	2.45	.26	.22	.23	.49	.38	.51	.52	1.01	.74	3.68	.94
MAX	26	.36	.27	.27	4.2	4.3	9.3	8.6	20	8.1	46	11
MIN	.18	.21	.20	.20	.19	.20	.14	.08	.08	.15	.16	.06
CFSM	1.06	.11	.10	.10	.21	.16	.22	.23	.44	.32	1.59	.41
IN.	1.22	.12	.11	.11	.22	.19	.24	.26	.49	.37	1.84	.46
AC-FT	150	15	14	14	27	23	30	32	60	46	226	56
(††)	4.92	0	.11	.04	.98	.59	1.08	1.47	2.16	1.56	7.09	2.66

CAL YR 1970 TOTAL 584.18 MEAN 1.60 MAX 78 MIN .10 CFSM .69 IN 9.41 AC-FT 1,160 †† 31.87
WTR YR 1971 TOTAL 349.67 MEAN .96 MAX 46 MIN .06 CFSM .42 IN 5.63 AC-FT 694 †† 22.66

PEAK DISCHARGE (BASE, 300 CFS).--Oct. 22 (2145) 433 cfs (5.28 ft); Aug. 4 (0645) 587 cfs (5.68 ft).

†† Weighted-mean rainfall, in inches.

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(Oct. 1951)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Sheet 1 of 1 Sheets

8-1570.

Monthly and yearly weighted-mean rainfall in inches, of Waller Creek River at near 38th St., Austin, Tex.
[Drainage area, 2.31 square miles]

16—26489-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL	Cal. Yr.
1956	-	-	-	-	-	0.49	0.60	3.00	1.40	0.44	1.37	0.21	-	
1957	1.31	2.04	2.08	0.49	2.73	3.49	9.37	7.07	5.06	.57	.03	6.85	41.09	50.37
1958	10.21	3.24	1.26	3.06	6.81	2.65	5.02	3.34	4.62	2.15	.84	7.20	50.40	43.99
1959	6.18	.92	1.20	.44	2.80	.26	4.86	2.20	3.30	4.39	5.07	4.00	35.62	38.60
1960	7.41	1.68	2.19	1.22	2.43	1.30	1.12	1.03	4.25	2.52	3.52	1.46	30.13	37.50
1961	12.11	2.13	4.41	1.48	5.03	.72	.15	1.21	11.95	8.37	.76	3.89	52.21	38.67
1962	1.01	2.36	1.74	.69	.99	1.19	4.87	1.43	8.71	.03	3.38	4.19	30.59	33.82
1963	3.96	1.26	3.12	.53	2.64	.24	2.77	1.42	3.59	.10	.47	1.30	21.40	16.92
1964	.91	1.68	1.27	2.85	1.51	2.25	1.47	1.91	5.71	1.19	1.62	7.91	30.28	34.36
1965	4.10	2.79	1.05	4.29	5.80	1.34	1.72	9.22	1.85	.32	.69	6.43	39.60	43.64
1966	3.50	3.33	5.15	1.42	2.73	.59	4.29	3.49	.94	.35	7.04	3.70	36.53	26.25
1967	.96	.08	.66	.15	1.43	.91	4.27	3.77	0	.99	5.03	6.71	24.96	36.13
1968	4.80	4.55	3.52	8.37	1.63	2.77	2.49	6.68	2.90	2.90	.77	2.98	44.36	38.35
1969	.58	5.59	.69	.40	4.16	2.90	4.92	2.91	2.13	.30	4.52	1.15	30.25	32.37
1970	3.26	.88	4.84	1.98	6.03	2.93	1.26	7.58	.21	.31	1.56	4.98	35.82	31.87
1971	4.92	0	.11	.04	.98	.59	1.08	1.47	2.16	1.56	7.09	2.66	22.66	

9-220c
(Oct. 1951)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Sheet 1 of 1 Sheets

8-1570

Monthly and yearly mean discharge, in cfs, of Waller Creek at 38th Street, Austin, Tex.
[Drainage area, 2.31 square miles]

16—20489-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL
1955	-	-	-	-	-	-	0.15	0.78	0.37	0.30	0.28	0.04	-
1956	0	0.04	0.24	0.21	0.29	0.05	.03	.62	.24	.20	.27	.04	0.19
1957	.05	.39	.38	.11	.84	.90	5.87	4.21	5.26	.77	.68	1.94	1.77
1958	9.52	1.70	1.14	1.82	7.91	1.92	2.82	2.87	2.77	1.80	1.05	2.62	3.13
1959	2.63	1.53	1.43	1.04	1.65	1.00	2.72	.93	1.42	2.07	1.65	1.75	1.65
1960	3.59	1.14	1.12	.87	1.17	.92	.72	.54	1.82	1.26	1.52	.67	1.28
1961	10.0	1.41	2.86	1.59	3.99	.82	.47	.60	8.28	6.07	.97	2.17	3.27
1962	.78	1.19	1.02	.80	.82	.89	1.96	.82	5.81	.70	2.30	2.02	1.59
1963	1.40	.59	1.32	.67	1.91	.59	1.68	.65	1.52	.85	.84	.56	1.04
1964	.22	.34	.44	1.00	.82	1.04	.59	.64	3.18	.55	.62	4.23	1.13
1965	2.07	1.30	.68	2.66	4.85	1.00	1.23	6.10	1.39	.84	.90	3.03	2.15
1966	1.97	1.87	3.10	.89	1.73	.76	2.06	1.62	.89	.59	3.21	1.32	1.67
1967	.46	.22	.29	.21	.57	.35	1.72	1.32	.45	.55	2.34	3.07	.96
1968	2.67	3.44	2.10	10.1	1.47	2.11	1.56	4.44	1.83	1.80	.66	1.04	2.78
1969	.35	2.19	.57	.37	2.59	1.60	2.60	1.66	1.33	.55	2.29	.55	1.38
1970	1.01	.31	2.16	1.00	4.50	2.19	.73	4.53	.63	.54	.77	1.58	1.65
1971	2.45	.26	.22	.23	.49	.38	.51	.52	1.01	.74	3.68	.94	.96

08157500 Waller Creek at 23d Street, Austin, Tex.

LOCATION.--Lat 30°17'08", long 97°44'01", Travis County, on San Jacinto Boulevard, 50 ft upstream from bridge on East 23d Street at Austin, and 2.1 miles upstream from Colorado River.

DRAINAGE AREA.--4.13 sq mi.

PERIOD OF RECORD.--December 1954 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 509.95 ft above mean sea level.

AVERAGE DISCHARGE.--16 years, 3.58 cfs (11.77 inches per year, 2,590 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,560 cfs June 21 (gage height, 6.08 ft); minimum daily, 0.52 cfs Dec. 27.
Period of record: Maximum discharge, 3,710 cfs Oct. 29, 1960 (gage height, 7.96 ft); minimum daily, 0.2 cfs at times in 1955-57.
Maximum flood since 1885 occurred Apr. 22, 1915, stage unknown.

REMARKS.--Records good. Some regulation by small dam upstream. Diversion of city water into channel during the summer months from municipal and private swimming pools. Some diversions into and out of drainage area by storm sewers. Station is part of a hydrologic research project to study rainfall-runoff relation for small urban areas. Three recording and three nonrecording rain gages located in watershed.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.92	.98	1.1	.56	1.2	1.1	1.1	.80	.85	1.1	.96	.88
2	.94	1.1	.96	.66	1.3	1.8	1.1	.79	.79	1.3	32	.90
3	.90	1.3	.94	.80	1.2	1.0	.97	.86	.86	1.0	49	.90
4	.89	1.3	.85	.55	1.6	1.0	.98	.82	.83	.97	78	.90
5	10	.97	.80	.59	1.4	1.0	.94	1.0	1.0	.95	10	.91
6	1.3	.89	.73	.57	1.1	1.0	.97	3.2	.94	.77	7.2	.85
7	1.1	.89	.90	.58	1.1	1.0	1.0	.95	1.0	1.2	2.3	.92
8	1.1	.89	.98	.65	1.3	1.0	1.0	.87	.82	1.1	1.5	.90
9	.84	.91	.96	.72	1.3	1.1	.96	.85	1.1	1.1	1.4	1.0
10	.89	1.0	.96	.93	1.3	1.2	.94	.88	1.2	.92	1.1	14
11	1.1	.91	.88	1.0	1.3	1.1	.92	5.8	1.3	.75	1.3	3.6
12	3.0	.93	.84	1.1	1.2	13	1.0	.95	1.0	.98	1.2	.79
13	1.1	.87	.87	1.1	1.2	1.4	1.1	.80	.89	.78	1.1	.86
14	.96	.87	.89	1.2	1.3	.88	.96	.78	1.1	1.0	1.2	.86
15	.94	.81	1.0	1.2	1.4	.92	1.0	.75	.89	1.1	.94	14
16	.92	.90	.93	1.1	1.3	.92	19	.73	1.0	1.2	1.3	1.2
17	.83	.91	.90	1.1	1.3	.92	1.7	.82	1.1	1.0	.87	.88
18	3.8	1.1	1.0	1.2	1.3	1.0	.94	.89	1.1	.96	1.2	.90
19	12	.97	.92	1.1	5.1	1.3	1.0	.94	1.1	1.0	1.2	1.5
20	1.1	.99	1.0	1.2	1.0	.99	1.3	.81	.80	.84	1.2	1.1
21	1.1	.88	.93	1.3	.96	.92	.91	.87	57	1.1	1.2	1.7
22	32	.87	.99	1.4	1.1	1.1	.92	.77	1.5	1.2	1.0	21
23	48	.92	1.1	1.3	1.0	1.1	.84	.75	1.0	1.1	1.1	1.0
24	2.5	.89	.72	1.3	1.1	1.4	.80	20	1.1	.85	.81	1.1
25	1.2	.81	.63	1.3	8.5	1.3	.81	.87	1.1	1.0	1.1	.84
26	1.2	.79	.55	1.3	2.1	1.1	.89	.91	1.4	36	1.4	.85
27	16	.82	.52	1.9	1.0	1.0	1.1	.81	1.2	7.9	1.3	1.2
28	1.4	.86	.74	1.3	1.0	1.1	.97	.86	3.1	1.5	1.1	.93
29	1.1	.82	.85	1.2	------	1.0	.96	.79	1.4	1.0	4.7	.86
30	1.4	.95	.73	1.2	------	1.1	.91	.78	1.1	2.7	2.0	.85
31	.94	------	.57	1.1	------	1.1	------	.86	------	.83	.93	------
TOTAL	151.47	28.10	26.74	32.51	45.96	45.85	47.99	52.56	89.57	75.20	211.61	78.18
MEAN	4.89	.94	.86	1.05	1.64	1.48	1.60	1.70	2.99	2.43	6.83	2.61
MAX	48	1.3	1.1	1.9	8.5	13	19	20	57	36	78	21
MIN	.83	.79	.52	.55	.96	.88	.80	.73	.79	.75	.81	.79
CFSM	1.18	.23	.21	.25	.40	.36	.39	.41	.72	.59	1.65	.63
IN.	1.36	.25	.24	.29	.41	.41	.43	.47	.81	.68	1.91	.70
AC-FT	300	56	53	64	91	91	95	104	178	149	420	155
(††)	4.86	0	.09	.04	.90	.69	1.06	1.50	2.39	1.84	6.39	2.88

CAL YR 1970	TOTAL 1,161.72	MEAN 3.18	MAX 132	MIN .52	CFSM .77	IN 10.46	AC-FT 2,300	†† 31.82
WTR YR 1971	TOTAL 885.74	MEAN 2.43	MAX 78	MIN .52	CFSM .59	IN 7.98	AC-FT 1,760	†† 22.64

PEAK DISCHARGE (BASE, 800 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-23	1230	5.00	920	7-26	2230	4.96	900
6-21	1630	6.08	1,560	8- 4	0645	4.77	805

†† Weighted-mean rainfall, in inches.

9-220 c
(Oct. 1951)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Sheet 1 of 1 Sheets

8-1575.

Monthly and yearly weighted-mean rainfall in inches, of Waller Creek at 23rd St., Austin, Tex.
[Drainage area, 4.13 square miles]

16—26489-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL	Cal. Yr.
1956	-	-	-	-	-	0.42	0.58	3.08	1.04	0.43	1.38	0.21	-	
1957	1.31	2.06	2.08	0.50	2.51	3.73	9.53	6.84	5.04	.63	.02	6.70	40.95	49.99
1958	10.11	3.14	1.24	3.05	6.62	2.60	4.82	3.16	4.02	2.02	.68	7.32	48.78	42.38
1959	6.01	.88	1.20	.44	2.69	.22	4.80	2.04	3.41	4.79	4.70	4.04	35.22	38.23
1960	7.22	1.67	2.21	1.17	2.35	1.29	1.12	.98	4.34	2.39	3.60	1.49	29.83	37.93
1961	12.53	2.17	4.50	1.44	4.92	.67	.18	1.09	11.98	8.27	.88	3.82	52.47	38.19
1962	.94	2.30	1.68	.65	.92	1.20	4.82	1.39	8.32	.02	3.75	4.35	30.34	33.49
1963	3.83	1.12	3.12	.49	2.64	.22	2.92	1.16	3.56	.07	.49	1.27	20.89	16.74
1964	.86	1.70	1.36	3.00	1.56	2.14	1.46	1.75	5.52	.98	1.74	8.00	30.06	34.12
1965	4.16	2.78	1.04	4.36	5.79	1.46	1.85	9.92	1.57	.32	.65	6.38	40.28	44.34
1966	3.58	3.41	5.05	1.33	2.86	.62	4.06	3.52	.89	.32	7.33	3.86	36.83	26.62
1967	1.02	.10	.71	.17	1.43	.87	4.40	3.87	0	.80	5.09	6.32	24.78	35.62
1968	4.62	4.54	3.51	8.63	1.56	2.53	2.38	7.28	2.69	2.87	.82	2.82	44.25	38.44
1969	.60	5.62	.64	.34	4.08	2.78	4.97	3.03	2.18	.27	4.85	1.32	30.68	32.71
1970	3.27	.83	4.79	1.92	5.85	2.81	1.24	6.91	.23	.43	1.88	4.79	34.95	31.01
1971	4.86	0	.09	.04	.90	.69	1.06	1.50	2.39	1.84	6.39	2.88	22.64	

9-220 c
(Oct. 1951)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Sheet 1 of 1 Sheets

8-1575.

Monthly and yearly mean discharge, in cfs, of Waller Creek @ 23rd St Austin, Tex.
[Drainage area, 4.13 square miles]

16—26489-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL
1955	-	-	-	1.29	3.92	1.21	0.86	3.70	1.80	1.04	0.81	0.56	-
1956	0.55	0.72	0.84	.75	1.21	.56	.59	2.53	.76	.79	1.08	.60	0.92
1957	.97	1.44	1.31	.52	2.35	3.55	12.7	9.02	11.1	1.82	1.42	4.39	4.19
1958	18.1	3.63	2.50	4.09	14.7	4.42	6.98	6.45	5.50	4.32	2.37	6.11	6.55
1959	5.62	2.51	2.03	1.58	3.03	1.67	6.44	2.27	3.15	5.13	3.47	4.28	3.43
1960	8.92	2.77	2.63	2.27	3.21	2.52	2.12	1.65	4.12	2.70	3.15	1.81	3.16
1961	21.7	3.20	5.45	3.71	8.81	2.17	1.47	1.95	18.7	14.8	2.15	4.20	7.36
1962	1.63	2.85	2.32	1.66	1.88	2.02	4.31	1.91	10.8	1.33	5.21	4.67	3.37
1963	4.07	1.33	2.84	1.24	3.90	1.42	4.34	1.90	3.82	1.70	1.74	1.76	2.49
1964	1.10	1.22	1.14	2.30	1.86	2.36	1.60	1.68	6.66	1.51	1.79	9.54	2.71
1965	5.24	2.98	1.59	5.02	8.84	2.33	2.53	14.7	2.91	1.80	1.85	6.41	4.66
1966	3.44	3.49	5.20	1.65	3.14	1.64	3.48	3.10	1.66	1.42	6.91	2.72	3.16
1967	1.14	.63	.83	.65	1.37	1.01	4.00	3.03	1.06	1.25	4.91	5.41	2.11
1968	5.01	5.79	3.85	14.7	2.91	3.61	2.90	8.56	3.29	3.79	1.61	2.13	4.87
1969	1.01	4.06	1.17	.95	4.56	2.73	4.34	3.85	2.65	1.30	4.37	1.61	2.70
1970	2.46	1.26	3.67	2.12	7.77	4.07	1.68	7.73	1.58	1.42	1.96	3.44	3.24
1971	4.89	.94	.86	1.05	1.64	1.48	1.60	1.70	2.99	2.43	6.83	2.61	2.43

08159150 Wilbarger Creek near Pflugerville, Tex.

LOCATION.--Lat 30°27'16", long 97°36'02", Travis County, on left bank downstream from county road (Pfluger Lane), 800 ft downstream from Farm Road 685, 1.6 miles northeast of Pflugerville, and 1.9 miles downstream from Missouri-Kansas-Texas Railroad.

DRAINAGE AREA.--4.61 sq mi.

PERIOD OF RECORD.--August 1963 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 670.61 ft above mean sea level.

AVERAGE DISCHARGE.--8 years, 1.96 cfs (5.77 inches per year, 1,420 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 611 cfs Oct. 23 (gage height, 4.42 ft); no flow for many days.
Period of record: Maximum discharge, 1,760 cfs June 16, 1964 (gage height, 6.92 ft); no flow at times each year.
Maximum stage since at least 1894, occurred in September 1921, stage unknown, from information by local residents.

REMARKS.--Records good. Three recording rain gages located in watershed above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.38	.15	.14	.06	.08	.03				0	
2	.02	.38	.15	.13	.06	.07	.03				0	
3	.02	.38	.15	.13	.06	.06	.03				0	
4	.02	.38	.15	.13	.06	.05	.04				0	
5	.40	.33	.15	.12	.06	.05	.05				.03	
6	.05	.33	.15	.11	.06	.05	.03				0	
7	.04	.33	.15	.11	.06	.06	.03				.01	
8	.04	.33	.15	.11	.06	.08	.03				0	
9	.03	.29	.15	.11	.08	.08	.03				0	
10	.03	.29	.15	.11	.08	.08	.03				0	
11	.03	.27	.15	.11	.08	.08	.03				0	
12	.06	.25	.15	.11	.06	.16	.03				0	
13	.06	.25	.15	.11	.05	.16	.02				0	
14	.10	.25	.15	.10	.05	.07	.02				0	
15	.11	.25	.15	.09	.05	.05	.01				0	
16	.04	.25	.15	.09	.05	.05	.14				0	
17	.03	.21	.15	.09	.05	.05	.10				0	
18	.04	.21	.15	.09	.05	.05	.04				0	
19	.10	.21	.15	.08	.08	.05	.03				0	
20	.05	.21	.15	.08	.08	.04	.03				0	
21	.04	.20	.15	.08	.08	.04	.04				0	
22	1.8	.21	.15	.08	.04	.04	.03				0	
23	62	.20	.15	.08	.04	.04	.01				0	
24	2.1	.18	.15	.08	.04	.04	0				0	
25	.97	.18	.15	.08	.12	.04	0				0	
26	.70	.18	.15	.08	.18	.04	0				.02	
27	.55	.18	.15	.07	.08	.04	0				.01	
28	.43	.18	.15	.06	.08	.04	0				0	
29	.43	.18	.15	.06	------	.04	0				0	
30	.43	.18	.15	.06	------	.03	0				0	
31	.38	------	.15	.06	------	.03	------		------		0	------
TOTAL	71.12	7.65	4.65	2.94	1.90	1.84	.86	0	0	0	.07	0
MEAN	2.29	.26	.15	.095	.068	.059	.029	0	0	0	.002	0
MAX	62	.38	.15	.14	.18	.16	.14	0	0	0	.03	0
MIN	.02	.18	.15	.06	.04	.03	0	0	0	0	0	0
CFSM	.50	.06	.03	.02	.01	.01	.006	0	0	0	.0004	0
IN.	.57	.06	.04	.02	.02	.01	.006	0	0	0	0	0
AC-FT	141	15	9.2	5.8	3.8	3.7	1.7	0	0	0	.1	0
(††)	5.30	0	.08	0	1.09	.93	1.01	1.12	.95	1.23	4.95	1.65

CAL YR 1970 TOTAL 1,095.98 MEAN 3.00 MAX 99 MIN 0 CFSM .65 IN 8.84 AC-FT 2,170 †† 30.89
WTR YR 1971 TOTAL 91.03 MEAN .25 MAX 62 MIN 0 CFSM .05 IN .73 AC-FT 181 †† 18.31

PEAK DISCHARGE (BASE, 400 CFS).--Oct. 23 (1300) 611 cfs (4.42 ft).

†† Weighted-mean rainfall, in inches.

9-220c
(Oct. 1951)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Sheet 1 of 1 Sheets

8-1591.5

Monthly and yearly weighted-mean rainfall in inches, of Wilbarger Creek near Pflugerville, Tex.

[Drainage area, 4.61 square miles]

16—26439-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL	Cal. Yr.
1964	1.33	1.85	1.44	2.86	1.43	2.24	2.87	4.70	7.43	0.23	1.59	7.52	35.49	38.01
1965	2.99	2.97	1.18	5.07	6.39	.87	1.65	5.87	2.00	.23	3.23	4.97	37.42	40.75
1966	2.60	3.36	4.51	1.40	2.86	.71	5.64	2.67	1.63	.15	4.95	4.00	34.48	25.43
1967	.55	.10	.77	.28	1.94	.85	4.01	4.60	0	.64	2.46	4.87	21.07	32.15
1968	5.13	4.10	3.27	8.17	1.63	2.32	2.62	6.55	4.00	2.36	2.37	3.20	45.72	39.32
1969	.29	4.69	1.12	.32	3.97	2.80	4.63	1.33	2.76	.18	4.85	.98	27.92	29.98
1970	3.33	.66	4.17	1.59	5.20	3.50	.95	7.58	.36	.49	.63	5.21	33.67	30.89
1971	5.30	0	.08	0	1.09	.93	1.01	1.12	.95	1.23	4.95	1.65	18.31	

9-220 c
(Oct. 1951)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Sheet 1 of 1 Sheets

8-1591.5

Monthly and yearly mean discharge, in cfs, of Wilbarger Creek near Pflugerville, Tex.
[Drainage area, 4.61 square miles]

16—20489-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL
1963	-	-	-	-	-	-	-	-	-	-	0	0	-
1964	0	0	0	0	0	0.03	1.67	4.23	10.4	0.07	0	2.02	1.53
1965	.43	1.62	.71	6.45	15.4	2.01	.75	3.32	.57	.05	.08	.72	2.59
1966	.13	1.50	7.36	1.88	3.73	2.01	5.90	3.57	.18	.03	.18	.79	2.26
1967	.26	.10	.12	.091	.15	.043	.30	1.87	.042	0	.0003	.026	.25
1968	.97	6.03	5.69	16.7	3.80	4.63	3.15	8.59	2.27	1.18	.078	.085	4.45
1969	.020	.16	.46	.22	3.74	5.43	7.07	.89	.15	.011	.019	.012	1.49
1970	.006	.003	.51	1.26	9.53	11.4	1.07	8.94	1.37	.058	.002	.013	2.82
1971	2.29	.26	.15	.095	.068	.059	.029	0	0	0	.002	0	.25

Form TX-88
Rev. 10-69

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey - Water Resources Division

RAINFALL DATA SUMMARY

STUDY AREA WALLER CREEK 1971 WATER YEAR

Date of storm	RAIN GAGES 1-S	2-S	3-S	4-R	5-R	*6-R	W.M.R. 38th St.	W.M.R. 23d St.
Weight factor								
at 38th St.	0.360	0.006	0.338	0.287	0.009	-		
at 23d St.	.264	.101	.190	.161	.187	0.097		
Oct. 2, 1970	-	.01	-	-	-	-		
5	.64	.31	.77	.72	.36	.76		
11	.02	-	-	-	.04	-		
12	.11	.26	.10	.10	.40	.40		
18 a.m.	-	-	-	-	-	.04		
18 p.m.-19	.87	.78	.73	.71	.81	.89		
22	1.71	1.52	1.85	1.45	1.31	1.14		
23	1.02	.98	1.43	1.21	1.05	.85		
27	.70	.54	.24	.33	.76	1.01		
October totals	5.07	4.40	5.12	4.52	4.73	5.09	4.92	4.86
Nov. 13, 1970	.01	-	-	-	-	-		
November totals	.01	-	-	-	-	-	-	-

* Site is located at 23d Street only.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey - Water Resources Division

RAINFALL DATA SUMMARY

STUDY AREA WALLER CREEK 1971 WATER YEAR

Date of storm	RAIN GAGES 1-S	2-S	3-S	4-R	5-R	*6-R	W.M.R. 38th St.	W.M.R. 23d St.
Dec. 20, 1970	-	-	-	0.06	-	-		
21	0.01	-	0.13	.04	0.05	-		
23	.03	-	-	-	.05	0.07		
30	.05	-	-	-	-	.02		
December totals	.09	-	.13	.10	.10	.09	0.11	0.09
1970 Cal.yr.totals	31.01	30.08	33.36	31.15	29.61	29.39	31.87	31.82
Jan. 3, 1971	.08	.12	-	-	-	-		
12	.03	-	-	-	-	0		
13	.01	-	-	-	-	-		
January totals	.12	.12	-	-	-	0	.04	.04

* Site is located at 23d Street only.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey - Water Resources Division

RAINFALL DATA SUMMARY

STUDY AREA WALLER CREEK 1971 WATER YEAR

Date of storm	RAIN GAGES 1-S	2-S	3-S	4-R	5-R	*6-R	W.M.R. 38th St.	W.M.R. 23d St.
Feb. 2, 1971	0.03	0.02	-	-	-	-		
3	-	-	-	-	0.05	-		
4	.03	-	-	-	.03	-		
5	-	-	-	0.03	.05	-		
19	.33	.30	0.65	.10	.25	0.12		
24	.03	-	-	-	-	-		
25	.53	.58	.65	.53	.41	.42		
February totals	.95	.90	1.30	.66	.79	.54	0.98	0.90
Mar. 2, 1971	.11	.07	.03	.06	.10	-		
12	.57	.55	.50	.28	.69	.86		
25	.06	.05	.06	.05	.10	-		
March totals	.74	.67	.59	.39	.89	.85	.59	.69

* Site is located at 23d Street only.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey - Water Resources Division

RAINFALL DATA SUMMARY

STUDY AREA WALLER CREEK 1971 WATER YEAR

Date of storm	RAIN GAGES 1-S	2-S	3-S	4-R	5-R	*6-R	W.M.R. 38th St.	W.M.R. 23d St.
Apr. 4, 1971	0.02	-	-	-	-	-		
8	-	-	-	0.02	0.05	-		
16	1.05	1.07	1.04	.96	.90	0.85		
19	.03	Trace	.04	.05	.14	-		
20	.02	Trace	-	-	-	-		
April totals	1.12	1.07	1.08	1.03	1.09	.85	1.08	1.06
May 4	-	-	-	.22	.17	-		
6	.25	.21	.27	.08	.20	.17		
11	.36	.37	.38	.40	.37	.38		
20	.01	Trace	-	.04	-	-		
24	.90	.88	.85	.63	.86	.96		
May totals	1.52	1.46	1.50	1.37	1.60	1.51	1.47	1.50

* Site is located at 23d Street only.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey - Water Resources Division

RAINFALL DATA SUMMARY

STUDY AREA WALLER CREEK 1971 WATER YEAR

Date of storm	RAIN GAGES 1-S	2-S	3-S	4-R	5-R	*6-R	W.M.R. 38th St.	W.M.R. 23d St.
June 20, 1971	0.06	-	0.05	-	-	-		
21	2.25	1.86	1.16	2.02	2.37	2.64		
27-28	.31	.19	.15	.16	.37	.30		
29	.11	.23	.15	-	.03	-		
June totals	2.73	2.28	1.51	2.18	2.77	2.94	2.16	2.39
July 26, 1971	1.72	1.52	.93	1.16	1.94	2.61		
27	.02	.06	.02	-	.08	.12		
27-28	-	.12	.07	.09	0	-		
28	.02	-	-	-	.05	.10		
30	Trace	.06	.10	.14	-	.18		
31	.24	-	-	.10	-	-		
July totals	2.00	1.76	1.12	1.49	2.07	3.01	1.56	1.84

* Site is located at 23d Street only.

Form TX-88
Rev. 10-69

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey - Water Resources Division

RAINFALL DATA SUMMARY

STUDY AREA WALLER CREEK 1971 WATER YEAR

Date of storm	RAIN GAGES 1-S	2-S	3-S	4-R	5-R	*6-R	W.M.R. 38th St.	W.M.R. 23d St.
Aug. 2, 1971	0.75	0.55	1.71	1.46	-	1.12		
3 a.m.	-	-	-	-	-	.25		
3 p.m.	1.45	1.02	1.73	1.89	1.89	1.17		
4	3.30	2.60	2.98	1.63	2.25	1.76		
5	.23	.16	.54	.41	.66	.44		
6	.43	.12	.37	.27	(.20)	.31		
7	.35	.17	-	-	-	-		
12	-	-	.06	(.05)	-	-		
19	-	-	-	(.03)	-	-		
27	.10	.20	.29	.24	.07	-		
29	.25	.20	.23	.27	.09	.46		
30	.08	.14	.08	.08	-	.04		
August totals	6.94	5.16	7.99	6.33	5.16	5.55	7.09	6.39

* Site is located at 23d Street only.
( ) Estimated.

Form TX-88
Rev. 10-69

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey - Water Resources Division

RAINFALL DATA SUMMARY

STUDY AREA WALLER CREEK 1971 WATER YEAR

Date of storm	RAIN GAGES 1-S	2-S	3-S	4-R	5-R	*6-R	W.M.R. 38th St.	W.M.R. 23d St.
Sept. 10, 1971	1.04	1.20	0.50	0.58	0.80	0.81		
12	-	-	-	-	-	-		
15	.92	.62	.66	.40	.77	.44		
19	.16	.18	.15	.14	(.20)	.08		
22-23	1.03	1.22	.99	.93	1.50	1.11		
24	.04	.09	-	-	-	.07		
28	.12	.04	.07	.09	.10	-		
September totals	3.31	3.35	2.37	2.14	3.37	2.51	2.66	2.88
Water year totals	24.60	21.17	22.71	20.16	22.57	22.95	22.66	22.64

* Site is located at 23d Street only.

Form TX-88
Rev. 10-69

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey - Water Resources Division

RAINFALL DATA SUMMARY

STUDY AREA WILBARGER CREEK 1971 WATER YEAR

Date of storm	RAIN GAGES 1-R	2-R	3-R	Weighted-mean rainfall
Oct. 5, 1970	1.20	1.46	(1.25)	
18-19	.70	.74	.70	
20	-	-	.05	
21	-	-	.02	
22-23	1.72	1.76	1.96	
23	1.51	1.34	1.58	
October totals	5.13	5.30	5.56	5.30
Nov.	-	-	-	
November totals	-	-	-	-
Dec. 23, 1970	.08	.03	.05	
30	-	.05	.03	
December totals	.08	.08	.08	.08

( ) Estimated.

Form TX-88
Rev. 10-69

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey - Water Resources Division

RAINFALL DATA SUMMARY

STUDY AREA WILBARGER CREEK 1971 WATER YEAR

Date of storm	RAIN GAGES 1-R	2-R	3-R	Weighted-mean rainfall
1970 Calendar year totals	30.07	31.09	31.95	30.89
Jan.	-	-	-	
January totals	-	-	-	-
Feb. 4, 1971	.12	.11	.06	
19	.26	.34	.21	
21	-	-	.02	
24	.05	-	-	
25	.54	.77	.85	
February totals	.97	1.22	1.14	1.09
Mar. 5, 1971	.01	.01	.11	
6	.01	.01	.27	
12	.78	(.78)	.57	
28	.13	.10	-	
March totals	.93	.90	.95	.93

( ) Estimated.

Form TX-88
Rev. 10-69

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey - Water Resources Division

RAINFALL DATA SUMMARY

STUDY AREA WILBARGER CREEK 1971 WATER YEAR

Date of storm	RAIN GAGES 1-R	2-R	3-R	Weighted-mean rainfall
Apr. 16, 1971	0.94	0.98	0.80	
17	-	-	.12	
20	.06	.05	.10	
April totals	1.00	1.03	1.02	1.01
May 6, 1971	.20	.45	-	
11	.32	.30	.27	
24	.52	.62	.69	
May totals	1.04	1.37	.96	1.12
June 21, 1971	.31	.61	.78	
22	.07	-	-	
27	.07	-	.12	
28	.32	(.30)	.40	
June totals	.77	.91	1.30	.95

( ) Estimated.

Form TX-88
Rev. 10-69

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey - Water Resources Division

RAINFALL DATA SUMMARY

STUDY AREA WILBARGER CREEK 1971 WATER YEAR

Date of storm	RAIN GAGES 1-R	2-R	3-R	Weighted-mean rainfall
July 27-28, 1971	1.12	0.95	0.38	
30	.30	.50	.28	
July totals	1.42	1.45	.66	1.23
Aug. 2, 1971	.76	.90	.90	
3	.77	.60	.72	
3-4	.90	1.00	1.08	
5	.71	.94	.78	
6	.30	.30	.37	
7	.05	.05	.08	
19	.05	.02	-	
26	1.11	1.65	.94	
August totals	4.65	5.46	4.87	4.95

Form TX-88
Rev. 10-69

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey - Water Resources Division

RAINFALL DATA SUMMARY

STUDY AREA WILBARGER CREEK 1971 WATER YEAR

Date of storm	RAIN GAGES 1-R	2-R	3-R	Weighted-mean rainfall
Sept. 4, 1971	0.10	0.09	-	
18	.04	.04	0.20	
19	.19	.11	.08	
21-22	1.17	.88	.61	
23	.11	.10	.12	
24	.32	.30	.13	
25	.02	.06	.04	
27	-	.06	-	
September totals	1.95	1.64	1.18	1.65
1971 Water year totals	17.94	19.36	17.72	18.31

TX.-65(Rev.7-69)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station WALLER CREEK AT 38TH STREET AUSTIN, TEXAS

Period of Record JUNE 21, 1971 Drainage Area 2.31

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Discharge Inc.	Discharge In/Hr	Runoff Inches	Runoff Acc. In.
	June 21, 1971						
0000	2.22		1.1	189	.0007	.0055	.0055
1545	1.93		.20	190	.0001	.0008	.0063
50	1.92		.19	2	.0001	.0000	.0063
55	1.92		.19	2	.0001	.0000	.0063
1600	1.91		.17	2	.0001	.0000	.0063
05	1.93		.20	2	.0001	.0000	.0063
10	1.96		.26	2	.0002	.0000	.0063
15	2.20		.98	2	.0007	.0001	.0064
20	4.05		126	2	.0845	.0070	.0134
25	4.10		134	2	.0899	.0075	.0209
30	4.68		253	2	.1698	.0141	.0350
35	4.77		276	2	.1852	.0154	.0504
40	4.55		223	2	.1496	.0125	.0629
45	4.45		201	2	.1349	.0112	.0741
50	4.57		227	2	.1523	.0127	.0868
55	4.74		268	2	.1798	.0150	.1018
1700	4.82		290	4	.1946	.0324	.1342
15	4.60		234	6	.1570	.0392	.1734
30	4.50		212	6	.1422	.0356	.2090
45	4.17		147	6	.0986	.0246	.2336
1800	3.80		88	6	.0590	.0148	.2484
15	3.62		65	6	.0436	.0109	.2593
30	3.52		54	6	.0362	.0090	.2683
45	3.44		46	6	.0309	.0077	.2760
1900	3.37		40	6	.0268	.0067	.2827
15	3.29		33	6	.0221	.0055	.2882
30	3.21		27	6	.0181	.0045	.2927

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Discharge Inc.	Discharge In/Hr.	Runoff Inches	Runoff Acc. In
	June 21, 1971 (CONTINUED)						
1945	3.14		23	6	.0154	.0038	.2965
2000	3.10		21	6	.0141	.0035	.3000
15	3.07		19	6	.0127	.0032	.3032
30	3.06		19	6	.0127	.0032	.3064
45	3.03		17	6	.0114	.0028	.3092
2100	3.00		16	9	.0107	.0040	.3132
30	2.92		13	12	.0087	.0044	.3176
2200	2.82		9.3	12	.0062	.0031	.3207
30	2.68		5.8	12	.0039	.0020	.3227
2300	2.55		3.6	12	.0024	.0012	.3239
30	2.41		2.2	12	.0015	.0008	.3247
2400	2.33		1.6	6	.0011	.0003	.3250

Computed by EHT - BTB III Date 7/14/71 Checked by EHT - EEW Date 7/14/71

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

Sheet 1 of 1
Comp. by: FNT
Date 7/24/71
Check by EEW
Date 7/24/71

Study Area WALLER CREEK at 38th Street, AUSTIN, TEX. Date of storm June 21, 1971

Date & Time	Gage 4-R Weight Factor .811 Recorded	x Factor	Gage 5-R Weight Factor .189 Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	Accumulated Weighted Precipitation Recording Gages All Gages	(Rec. Gages x K) All Gages
June 21, 1971														
1545	0	0	0	0									0	0
50	0	0	.13	.02									.02	.02
55	0	0	.53	.10									.10	.09
1600	0	0	1.10	.21									.21	.18
05	.03	.02	1.60	.30									.32	.28
10	.20	.16	1.71	.32									.48	.42
15	.55	.45	1.80	.34									.79	.68
20	.97	.79	1.82	.34									1.13	.98
25	1.28	1.04	1.91	.36									1.40	1.21
30	1.48	1.20	1.98	.37									1.57	1.36
35	1.55	1.26	2.09	.40									1.66	1.44
40	1.60	1.30	2.11	.40									1.70	1.47
45	1.64	1.33	2.12	.40									1.73	1.50
50	1.72	1.39	2.12	.40									1.79	1.55
55	1.76	1.43	2.13	.40									1.83	1.58
1700	1.80	1.46	2.13	.40									1.86	1.61
15	1.82	1.48	2.13	.40									1.88	1.63
30	1.85	1.50	2.18	.41									1.91	1.65
45	1.88	1.52	2.22	.42									1.94	1.68
1800	1.92	1.56	2.27	.43									1.99	1.72
15	1.96	1.59	2.32	.44									2.03	1.76
30	1.98	1.61	2.35	.44									2.05	1.78
45	2.00	1.62	2.36	.45									2.07	1.79
1900	2.01	1.63	2.37	.45									2.08	1.80
15	2.02	1.64	2.37	.45									2.09	1.81
30	2.02	1.64	2.37	.45									2.09	1.81

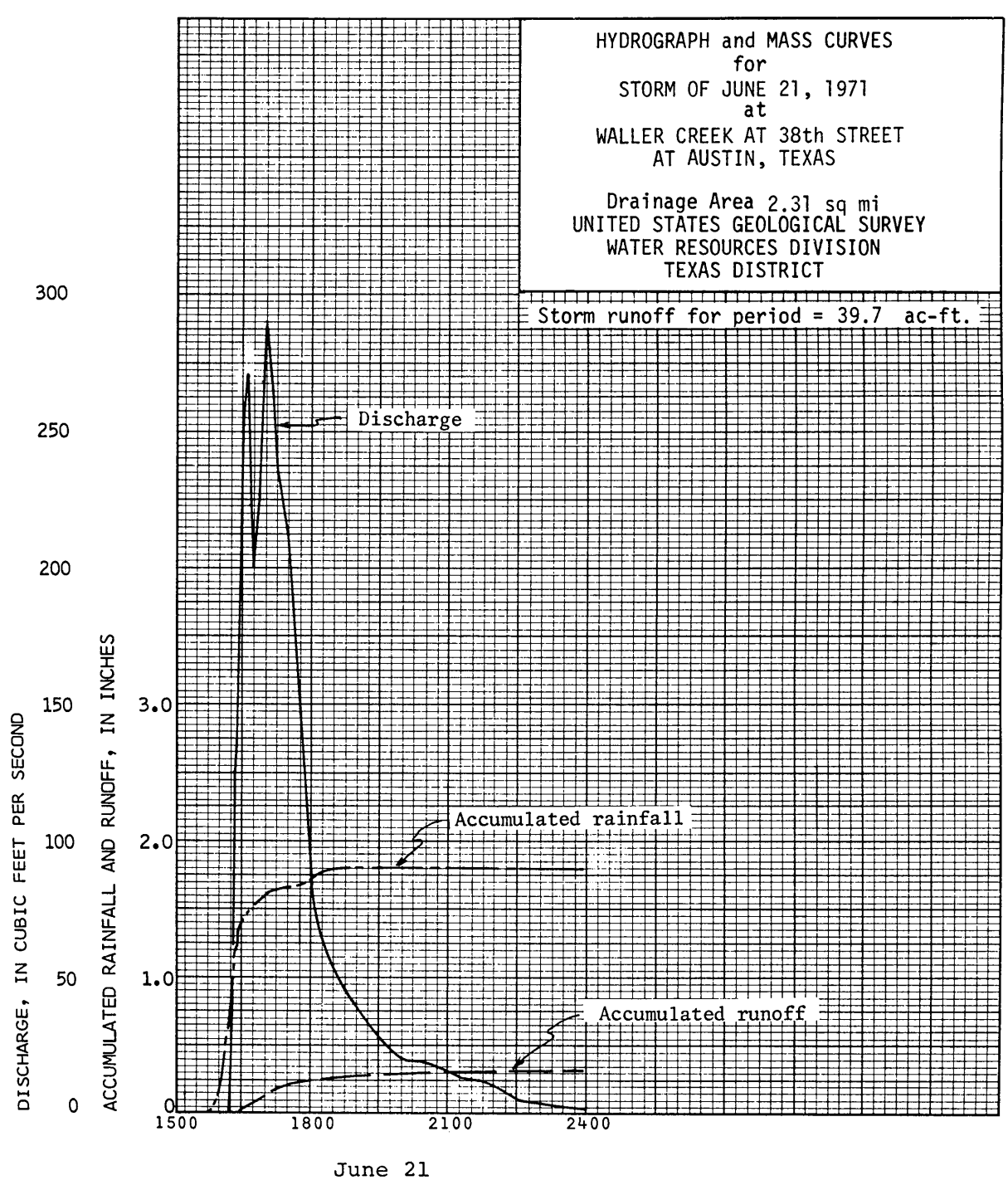
Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
1-S	.340	2.25	.81
2-S	.006	1.86	.01
3-S	.338	1.16	.39
4-R	.287	2.02	.58
5-R	.009	2.37	.02

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor

WMR: 1.81

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation = 1.81 / 2.09 = .8660


HYDROGRAPH and MASS CURVES
for
STORM OF JUNE 21, 1971
at
WALLER CREEK AT 38th STREET
AT AUSTIN, TEXAS
Drainage Area 2.31 sq mi
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT
Storm runoff for period = 39.7 ac-ft.
Discharge
Accumulated rainfall
Accumulated runoff
DISCHARGE, IN CUBIC FEET PER SECOND
ACCUMULATED RAINFALL AND RUNOFF, IN INCHES
300
250
200
150
100
50
0
3.0
2.0
1.0
0
1500
1800
2100
2400
June 21

TX.-65 (Rev. 7-69)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station WALLER CREEK at 38th ST., AUSTIN, TEX.

Period of Record July 26, 1971 July 27, 1971 Drainage Area 2.31

Time	G. Ht. Feet	Sh. Adj.	Discharge C.f.s.	Inc.	In/Hr.	Runoff Inches	Acc. In.
July 26, 1971							
0000	2.21	0	1.0	4	.0007	.0004	.0004
0100	2.17		.86	8	.0006	.0006	.0010
0206	2.14		.75	8	.0005	.0005	.0015
0300	2.11		.64	8	.0004	.0004	.0019
0400	2.08		.55	12	.0004	.0006	.0025
0600	2.03		.41	20	.0003	.0008	.0033
0900	1.97		.28	32	.0002	.0008	.0041
1400	1.90		.16	36	.0001	.0004	.0045
1800	1.85		.09	32	.0001	.0004	.0049
2206	1.93		.20	17	.0001	.0002	.0051
15	3.12		22	2	.0148	.0037	.0088
30	3.45		47	2	.0315	.0079	.0167
45	4.21		154	2	.1033	.0258	.0425
2300	4.05		126	2	.0845	.0211	.0636
15	4.18		148	2	.0993	.0248	.0884
30	4.01		119	2	.0798	.0200	.1084
45	3.82		91	2	.0611	.0153	.1237
2400	3.80	0	88	1	.0590	.0074	.1311
July 27, 1971							
0000	3.80	0	88	1	.0590	.0074	.1385
15	3.57		60	2	.0403	.0101	.1486
30	3.37		40	2	.0268	.0067	.1553
45	3.24		30	2	.0201	.0050	.1603
0100	3.16		24	2	.0161	.0040	.1643
15	3.10		21	2	.0141	.0035	.1678
30	3.08		20	2	.0134	.0034	.1712

Time	G. Ht. Feet	Sh. Adj.	Discharge C.f.s.	Inc.	In/Hr.	Runoff Inches	Acc. In
July 27, 1971 (CONTINUED)							
0145	3.07		19	2	.0127	.0032	.1744
0200	3.05		18	3	.0121	.0045	.1789
30	3.01		16	4	.0107	.0054	.1843
0300	2.96		14	4	.0094	.0047	.1890
30	2.90		12	4	.0081	.0040	.1930
0406	2.82		9.3	4	.0062	.0031	.1961
30	2.70		6.2	4	.0042	.0021	.1982
0500	2.55		3.6	4	.0024	.0012	.1994
30	2.42		2.2	4	.0015	.0008	.2002
0600	2.34		1.7	4	.0011	.0006	.2008
30	2.29		1.4	4	.0009	.0004	.2012
0706	2.24		1.2	4	.0008	.0004	.2016
30	2.20		98	4	.0007	.0004	.2020
0800	2.16		.61	10	.0004	.0009	.2029
1000	2.05		.47	16	.0003	.0006	.2035
1200	2.01		.36	20	.0002	.0005	.2040
1500	1.93		.20	24	.0001	.0003	.2043
1800	1.96		.26	24	.0002	.0006	.2049
2100	1.97		.28	14	.0002	.0004	.2053
30	1.99		.32	3	.0002	.0001	.2054
45	2.62		4.7	2	.0032	.0008	.2062
2200	2.63		4.9	3	.0033	.0012	.2074
30	2.52		3.2	4	.0021	.0010	.2084
2300	2.29		1.4	4	.0009	.0004	.2088
30	2.13		.71	4	.0005	.0002	.2090
2400	2.07		.52	2	.0003	.0001	.2091

Computed by FHT Date 12/15/71 Checked by EEW Date 2-1-72

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

Sheet 1 1 of 2
Comp. by: FHT
Date 12/7/71
Check by EEW
Date 2/16/71

Study Area Waller Creek at 38th Street, Austin, Tex. Date of storm July 26, July 27, 1971

Accumulated Precipitation in Inches for Recording Rain Gages

Weight Factor	Gage 4-R		Gage 5-R		Gage		Gage		Gage		Gage		Accumulated Weighted Precipitation Recording Gages	(Rec. Gages x K) All Gages
	.811		.189											
Date & Time	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	All Gages	
July 26, 1970														
2130	0	0	0	0									0	0
35	0	0	.02	0									0	0
40	0	0	09	.02									.02	.01
45	0	0	.22	.04									.04	.04
50	0	0	.37	.07									.07	.07
55	0	0	.72	.14									.14	.14
2200	0	0	1.00	.19									.19	.19
05	.01	.01	1.17	.22									.23	.23
10	.02	.02	1.42	.27									.29	.29
15	.10	.08	1.47	.28									.36	.36
20	.25	.20	1.52	.29									.49	.49
25	.46	.36	1.59	.30									.66	.65
30	.68	.55	1.67	.32									.87	.86
35	.76	.62	1.82	.34									.96	.95
40	.80	.65	1.87	.35									1.00	.99
46	.90	.73	1.90	.36									1.09	1.08
2300	.95	.77	1.92	.36									1.13	1.12
05	.95	.77	1.92	.36									1.13	1.12
10	.96	.78	1.92	.36									1.14	1.13
15	.97	.79	1.92	.36									1.15	1.14
20	.97	.79	1.92	.36									1.15	1.14
25	.98	.79	1.92	.36									1.15	1.14
30	.98	.79	1.92	.36									1.15	1.14
45	.99	.80	1.92	.36									1.16	1.15
2400	1.00	.81	1.92	.37									1.18	1.17
July 27, 1971														
0015	1.02	.83	1.97	.37									1.20	1.19

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
										WMR:	

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation =

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

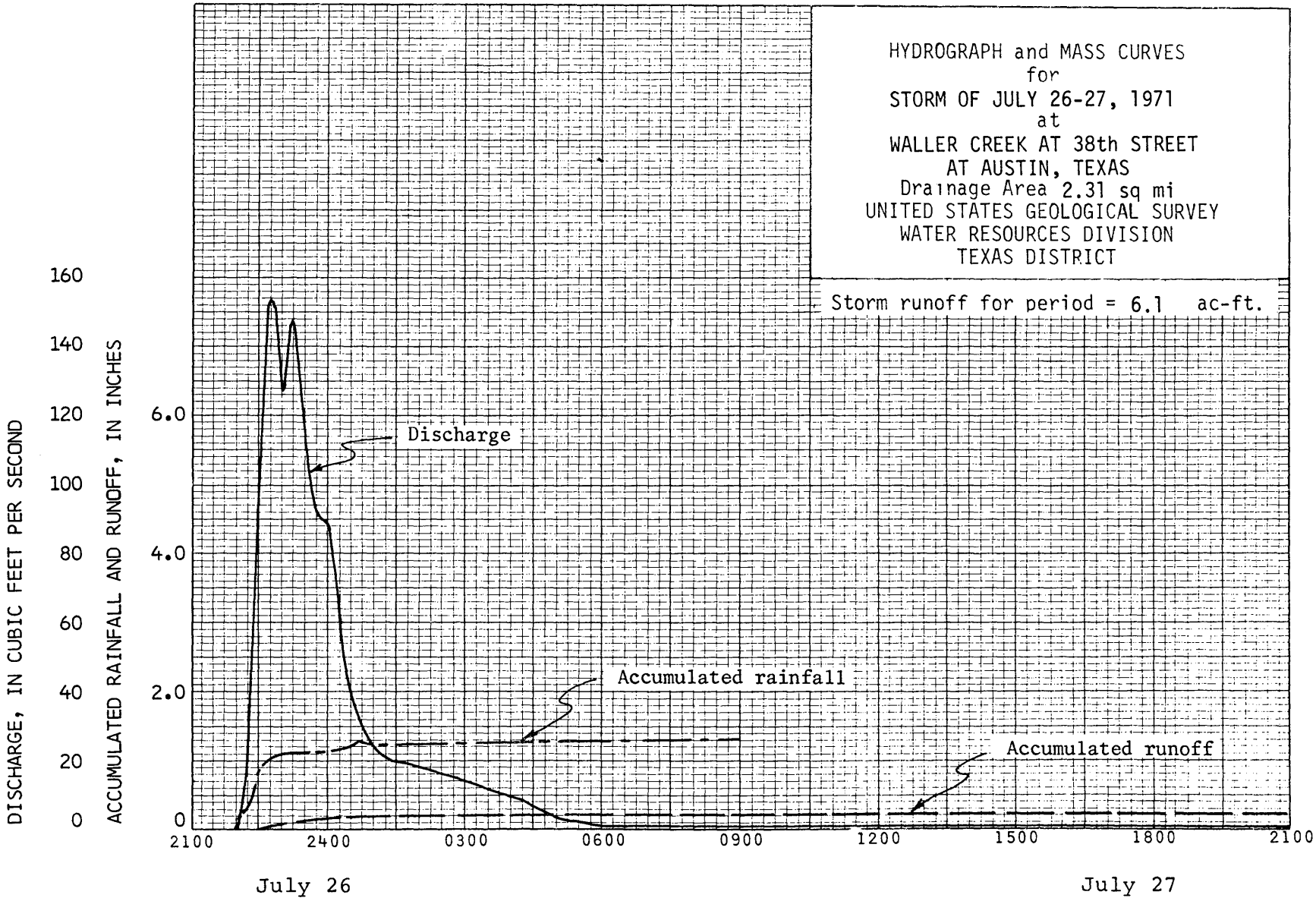
Sheet 2 of 2
Comp. by: FHT
Date 12/7/71
Check by EEW
Date 2/16/71

Study Area Waller Creek at 38th Street, Austin, Tex. Date of storm July 26, July 27, 1971

Weight Factor	Accumulated Precipitation in Inches for Recording Rain Gages										Accumulated Weighted Precipitation	
	Gage .811 4-R		Gage .189 5-R		Gage		Gage		Gage		Recording Gages	(Rec. Gages x K)
Date & Time	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	All Gages	All Gages
July 27, 1971 (CONTINUED)												
0030	1.08	.88	1.98	.37							1.25	1.24
45	1.09	.88	2.01	.38							1.26	1.25
0100	1.11	.90	2.01	.38							1.28	1.27
30	1.11	.90	2.01	.38							1.28	1.27
0200	1.11	.90	2.02	.38							1.28	1.27
30	1.11	.90	2.02	.38							1.28	1.27
0300	1.12	.91	2.02	.38							1.29	1.28
0500	1.15	.93	2.02	.38							1.31	1.30
0600	1.16	.94	2.02	.38							1.32	1.31
0700	1.16	.94	2.02	.38							1.32	1.31
1200	1.16	.94	2.02	.38							1.32	1.31

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
1-S	.360	1.74	.63								
2-S	.006	1.58	.01								
3-S	.338	.95	.32								
4-R	.287	1.16	.33								
5-R	.009	2.02	.02								
										WMR:	1.31

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation = 1.31 / 1.32 = .9924


HYDROGRAPH and MASS CURVES
for
STORM OF JULY 26-27, 1971
at
WALLER CREEK AT 38th STREET
AT AUSTIN, TEXAS
Drainage Area 2.31 sq mi
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT
Storm runoff for period = 6.1 ac-ft.
DISCHARGE, IN CUBIC FEET PER SECOND
ACCUMULATED RAINFALL AND RUNOFF, IN INCHES
160
140
120
100
80
60
40
20
0
6.0
4.0
2.0
0
Discharge
Accumulated rainfall
Accumulated runoff
2100
2400
0300
0600
0900
1200
1500
1800
2100
July 26
July 27

TX.-65 (Rev. 7-69)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station WALLER CREEK at 38th St., AUSTIN, TEX

Period of Record Aug 2-4, 1971 Drainage Area 2.31

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Inc.	In/Hr	Runoff Inches	Acc. In.
Aug 2, 1971							
0000	2.02	0	.39	4	.0003	.0002	.0002
0100	1.97		.28	24	.0002	.0006	.0008
0600	1.89		.14	22	.0001	.0003	.0011
30	1.92		.19	3	.0001	.0000	.0011
45	2.94		13	2	0087	.0022	.0033
0700	3.07		19	2	.0127	.0032	.0065
15	3.58		61	2	.0409	.0102	.0167
30	3.99		116	2	.0778	.0194	.0361
45	4.27		165	2	.1107	.0277	.0638
0800	4.19		150	2	.1006	.0252	.0890
15	4.10		134	2	.0899	.0225	.1115
30	4.09		132	2	.0886	.0222	.1337
45	4.19		150	2	.1006	.0252	.1589
0900	4.23		157	3	.1053	.0395	.1984
30	3.79		87	4	.0584	.0292	.2276
1000	3.44		46	4	.0309	.0154	.2430
30	3.24		30	4	.0201	.0100	.2530
1100	3.16		24	14	.0161	.0282	.2812
1400	3.06		19	24	.0127	.0381	.3193
1700	2.73		70	24	.0047	.0141	.3334
2000	2.36		1.8	28	.0012	.0042	.3376
2400	2.10	0	.61	16	.0004	.0008	.3384
Aug 3, 1971							
0000	2.16	0	.61	4	.0004	.0002	.3386
0100	2.05		.47	20	.0003	.0008	.3394
0500	1.96		.26	18	.0002	.0004	.3398

Time	G. Ht. Feet	Sh. Adj.	Discharge C.f.s.	Inc.	In/Hr.	Runoff Inches	Acc. In
Aug 3, 1971 (CONTINUED)							
0530	2.06		.49	3	.0003	.0001	.3399
45	2.98		15	2	.0101	.0025	.3424
0600	3.05		18	2	.0121	.0030	.3454
15	3.71		76	2	.0510	.0128	.3582
30	3.76		75	2	.0503	.0126	.3708
45	3.86		96	2	.0644	.0161	.3869
0700	3.69		74	3	.0497	.0186	.4055
30	3.33		37	4	.0248	.0124	.4179
0800	3.11		21	6	.0141	.0106	.4285
0900	3.00		16	8	.0108	.0108	.4393
1000	2.85		10	5	.0067	.0042	.4435
15	2.83		9.6	2	.0064	.0016	.4451
30	2.83		9.6	2	.0064	.0016	.4476
45	2.83		9.6	2	.0064	.0016	.4483
1100	2.83		9.6	2	.0064	.0016	.4499
15	2.80		8.7	2	.0058	.0014	.4513
30	2.75		7.5	2	.0050	.0012	.4525
45	2.69		6.0	2	.0040	.0010	.4535
1200	2.62		4.7	2	.0032	.0008	.4543
15	2.54		3.5	2	.0023	.0006	.4549
30	2.47		2.7	3	.0018	.0007	.4556
1300	2.43		2.3	4	.0015	.0008	.4564
30	2.37		1.9	4	.0013	.0006	.4570
1400	2.31		1.5	4	.0010	.0005	.4575
30	2.28		1.4	3	.0009	.0003	.4578
45	3.05		18	2	.0121	.0030	.4608
1500	2.81		9.0	2	.0060	.0015	.4623

Computed by EHT Date 12/15/71 Checked by EEW Date 2-2-72

TX.-65 (Rev. 7-69)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station WALLER CREEK at 38th St., AUSTIN, TEX.

Period of Record Aug. 2-4, 1971 Drainage Area 2.31

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Inc.	In/Hr	Runoff Inches	Acc. In.
Aug 3, 1971 (CONTINUED)							
1515	2.71	0	6.5	4	.0044	.0022	.4645
1600	2.68		5.8	5	.0039	.0024	.4669
30	2.78		8.2	3	.0055	.0021	.4690
45	2.83		9.6	2	.0064	.0016	.4706
1700	3.11		21	2	.0141	.0035	.4741
15	3.32		36	2	.0242	.0060	.4801
30	3.93		107	2	.0718	.0180	.4981
45	4.10		134	2	.0899	.0225	.5206
1800	4.11		136	2	.0913	.0228	.5434
15	4.07		129	2	.0866	.0216	.5650
30	4.02		120	2	.0805	.0201	.5851
45	3.87		98	2	.0658	.0164	.6015
1900	3.70		75	2	.0503	.0126	.6141
15	3.64		68	2	.0456	.0114	.6255
30	3.51		53	2	.0356	.0089	.6344
45	3.39		42	2	.0282	.0070	.6414
2000	3.32		36	3	.0242	.0091	.6505
30	3.18		26	4	.0174	.0087	.6592
2100	3.07		19	6	.0127	.0095	.6687
2200	3.02		17	6	.0114	.0086	.6778
30	2.99		15	3	.0101	.0038	.6811
45	3.37		40	2	.0268	.0067	.6878
2300	3.50		52	2	.0349	.0087	.6965
15	3.75		82	2	.0550	.0138	.7103
30	3.77		84	2	.0564	.0141	.7244
45	3.64		68	2	.0456	.0114	.7358
2400	3.53	0	55	1	.0369	.0046	.7404

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Inc.	In/Hr.	Runoff Inches	Acc. In
	Aug 4, 1971						
0000	3.53	0	55	2	.0369	.0092	.7496
30	3.41		43	4	.0289	.0144	.7640
0100	3.18		26	4	.0174	.0087	.7727
30	3.07		19	4	.0127	.0064	.7791
0200	3.04		18	4	.0121	.0060	.7851
30	2.98		15	4	.0101	.0050	.7901
0300	2.91		12	4	.0081	.0040	.7941
30	2.82		9.3	4	.0062	.0031	.7972
0400	2.72		6.7	4	.0045	.0022	.7994
30	2.59		4.2	4	.0028	.0014	.8008
0500	2.50		3.0	3	.0020	.0008	.8016
15	2.72		6.7	2	.0045	.0011	.8027
30	2.88		11	2	.0074	.0018	.8045
45	3.66		70	2	.0470	.0118	.8163
0600	5.01		343	2	.2302	.0576	.8739
15	5.13		381	2	.2557	.0639	.9378
30	5.33		451	2	.3026	.0756	1.0134
45	5.68		587	2	.3939	.0985	1.1119
0700	5.21		409	2	.2744	.0686	1.1805
15	4.84		295	2	.1979	.0495	1.2300
30	4.49		210	2	.1409	.0352	1.2652
45	4.18		148	2	.0993	.0248	1.2900
0800	3.96		111	2	.0745	.0186	1.3086
15	3.79		87	2	.0584	.0146	1.3232
30	3.68		73	2	.0490	.0122	1.3354
45	3.60		63	2	.0423	.0106	1.3460
0900	3.61		64	2	.0429	.0107	1.3567

Computed by FHT Date 12/15/71 Checked by EEW Date 2-2-72

TX.-65 (Rev.7-69)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station WALLER CREEK at 38th ST., AUSTIN, TEX.

Period of Record Aug 2-4, 1971 Drainage Area 2.31

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Inc.	In/Hr.	Runoff Inches	Acc. In.
Aug 4, 1971 (CONTINUED)							
0915	3.62	0	65	2	.0436	.0109	1.3676
30	3.87		98	2	.0658	.0164	1.3840
45	3.93		107	2	.0718	.0180	1.4020
1000	3.71		76	2	.0510	.0128	1.4148
15	3.54		56	2	.0376	.0094	1.4242
30	3.44		46	2	.0309	.0077	1.4319
45	3.32		36	2	.0242	.0060	1.4379
1100	3.20		27	3	.0181	.0068	1.4447
30	3.03		17	4	.0114	.0028	1.4475
1200	2.91		12	4	.0081	.0040	1.4515
30	2.85		10	4	.0067	.0034	1.4549
1300	2.78		8.2	4	.0055	.0028	1.4577
30	2.73		7.0	4	.0047	.0024	1.4601
1400	2.67		5.6	10	.0038	.0048	1.4649
1600	2.60		4.3	24	.0029	.0087	1.4736
2000	2.53		3.3	32	.0022	.0088	1.4824
2400	2.42	0	2.2	16	.0015	.0030	1.4854

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Inc.	In/Hr.	Runoff Inches	Acc. In

Computed by FHT Date 12/15/71 Checked by EEW Date 2-2-72

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

Sheet 1 of 7
Comp. by: FHT
Date 12/15/71
Check by EEW
Date 2/23/72

Study Area Waller Creek at 38th Street, Austin, Tex. Date of storm Aug 2-4, 1971

Date & Time	Gage 4-R Recorded	Gage 4-R x Factor (.811)	Gage 5-R Recorded	Gage 5-R x Factor (.189)	Gage Recorded	Gage x Factor	Gage Recorded	Gage x Factor	Gage Recorded	Gage x Factor	Gage Recorded	Gage x Factor	Accumulated Weighted Precipitation Recording Gages All Gages	(Rec. Gages x K) All Gages
Aug 2, 1971														
0600	0	0	0	0									0	0
05	0	0											0	0
10	0	0											0	0
15	0	0											0	0
20	.06	.05											.05	.05
25	.27	.22											.22	.24
30	.39	.32											.32	.34
35	.53	.43											.43	.46
40	.57	.46											.46	.49
45	.60	.49											.49	.53
0700	.64	.52											.52	.56
15	.69	.56											.56	.60
30	.78	.63											.63	.68
35	.80	.65											.65	.70
40	.88	.71											.71	.76
45	.95	.77											.77	.83
0800	1.03	.84											.84	.90
0930	1.08	.88											.88	.95
1000	1.14	.92											.92	.99
30	1.18	.96											.96	1.03
1100	1.22	.99											.99	1.07
30	1.26	1.02											1.02	1.10
1200	1.29	1.05											1.05	1.13
1300	1.34	1.09											1.09	1.17
1400	1.40	1.14											1.14	1.23
1600	1.46	1.18	0	0									1.18	1.27

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
1-S	.360	.75	.27								
2-S	.006	.55	0								
3-S	.338	1.71	.58								
4-R	.287	1.46	.42								
5-R	.009	0	0								
										WMR:	1.27

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation = 127/118 = 1.076

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Sheet 2 of 7

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

Comp. by: FHT
Date 12/15/71
Check by EEW
Date 2/23

WEIGHTED-PRECIPITATION RECORD

Study Area Waller Creek at 38th Street, Austin, Tex. Date of storm Aug 2-4, 1971

Accumulated Precipitation in Inches for Recording Rain Gages													Accumulated Weighted Precipitation	
Weight Factor	.811		.189										Recording Gages	(Rec. Gages x K)
Date & Time	Gage 4-R Recorded	x Factor	Gage 5-R Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	All Gages	All Gages
Aug 3, 1971														
0200														1.27
0300			See sheets 5-7											1.28
0500														1.31
15														1.34
20														1.39
25														1.39
30														1.62
35														1.66
40														1.70
45														1.74
50														1.76
55														1.80
0600														1.84
15														1.88
30														1.90
0915														1.90
20														1.94
25														2.03
30														2.05
1430														2.09
1445														2.14
1500														2.31
1600														2.35
1645														2.37
50														2.38
55														2.43
1700														2.45

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
										WMR:	

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation =

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UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

Sheet 3 of 7
Comp. by: FHT
Date 12/15/71
Check by EEN
Date 2/23/72

Study Area Waller Creek at 38th Street, Austin, Tex. Date of storm Aug 2-4, 1971

Date & Time	Accumulated Precipitation in Inches for Recording Rain Gages: Gage 4-R Recorded	Gage 4-R x Factor	Gage 5-R Recorded	Gage 5-R x Factor	Gage Recorded	Gage x Factor	Gage Recorded	Gage x Factor	Gage Recorded	Gage x Factor	Gage Recorded	Gage x Factor	Accumulated Weighted Precipitation: Recording Gages	Recording Gages (Rec. Gages x K) All Gages
	Weight Factor	.81		.189										
Aug 3, 1971 (CONTINUED)														
1705														2.52
10														2.61
15		See sheets 6-7												2.70
20														2.73
25														2.85
30														2.91
35														2.96
40														3.02
45														3.05
1800														3.14
30														3.21
1900														3.26
2100														3.30
2145														3.32
2200														3.34
15														3.35
30														3.43
35														3.44
40														3.50
45														3.55
50														3.59
55														3.63
2300														3.69
15														3.74
30														3.75
2400														3.75

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
										WMR:	

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation =

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UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

Sheet 4 of 7
Comp. by: FHT
Date 12/15/71
Check by EEN
Date 2/23/72

Study Area Waller Street at 38th Street, Austin, Tex. Date of storm Aug. 2-4, 1971

Date & Time	Accumulated Precipitation in Inches for Recording Rain Gages												Accumulated Weighted Precipitation	
Weight Factor	.811		.189											
	Gage 4-R		Gage 5-R		Gage		Gage		Gage		Gage		Recording Gages	(Rec. Gages x K)
	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	All Gages	All Gages
Aug 4, 1971														
0445		See Sheets 5-7												3.81
55														3.83
0500														3.86
15														3.98
30														4.06
45														4.15
50														4.21
55														4.47
0600														4.61
05														4.69
10														4.76
15														4.86
30														4.98
45														5.04
0700														5.13
15														5.18
30														5.22
45														5.23
0800														5.26
30														5.33
0900														5.46
15														5.64
30														5.64
1000														5.64
1100														5.69

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
										WMR	

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation =

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

Sheet 5 of 7
Comp. by: EHT
Date 12/15/71
Check by EEW
Date 2/23/72

Study Area WALLER CREEK at 38th STREET, AUSTIN, TEX Date of storm Aug 2-4, 1971

Date & Time	Accumulated Precipitation in Inches for Recording Rain Gages												Accumulated Weighted Precipitation	
Weight Factor	.811		.189										Recording Gages All Gages	(Rec. Gages x K) All Gages
	Gage 4-R		Gage 5-R		Gage		Gage		Gage		Gage			
	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor		
Aug 3, 1971														
0200	0	0	0	0									0	0
0300	.01	.01											.01	.01
0500	.04	.03											.03	.04
15	.07	.06											.06	.07
20	.12	.10											.10	.12
25	.24	.10											.10	.12
30	.36	.29											.29	.35
35	.39	.32											.32	.39
40	.45	.36											.36	.43
45	.48	.39											.39	.47
50	.51	.41											.41	.49
55	.54	.44											.44	.53
0600	.58	.47											.47	.57
15	.63	.51											.51	.61
30	.64	.52											.52	.63
0915	.64	.52											.52	63
20	.69	.56											.56	.67
25	.78	.63	0	0									.63	.76
30	.78	.63	.10	.02									.65	.78
1430	.78	.63	.25	.05									.68	.82
1445	.78	.63	.50	.09									.72	.87
1500	.83	.67	1.00	.19									.86	1.04
1600	.88	.71	1.00	.19									.90	1.08
1645	.89	.72	1.00	.19									.91	1.10
50	.89	.72	1.05	.20									.92	1.11
55	.89	.72	1.28	.24									.96	1.16
1700	.89	.72	1.40	.26									.98	1.18

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
										WMR:	

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation =

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

Sheet 6 of 7
Comp. by: FHT
Date 12/15/71
Check by EEW
Date 2/23/72

Study Area WALLER CREEK at 38th STREET, AUSTIN, TEX Date of storm Aug 2-4, 1971

Accumulated Precipitation in Inches for Recording Rain Gages													Accumulated Weighted Precipitation	
Weight Factor	.811		.189										Recording Gages	(Rec. Gages x K)
	Gage 4-R		Gage 5-R		Gage		Gage		Gage		Gage		All Gages	All Gages
Date & Time	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor		
Aug. 3, 1971 (Continued)														
1705	.94	.76	1.49	.28									1.04	1.25
10	1.00	.81	1.60	.30									1.11	1.34
15	1.07	.87	1.67	.32									1.19	1.43
20	1.09	.88	1.77	.33									1.21	1.46
25	1.19	.97	1.80	.34									1.31	1.58
30	1.24	1.01	1.84	.35									1.36	1.64
35	1.29	1.05	1.85	.35									1.40	1.69
40	1.36	1.10	1.85	.35									1.45	1.75
45	1.39	1.13	1.87	.35									1.48	1.78
1800	1.44	1.17	2.00	.38									1.55	1.87
30	1.49	1.21	2.12	.40									1.61	1.94
1900	1.54	1.25	2.12	.40									1.65	1.99
2100	1.57	1.27	2.20	.42									1.69	2.03
2145	1.58	1.28	2.20	.42									1.70	2.05
2200	1.59	1.29	2.30	.43									1.72	2.07
15	1.59	1.29	2.35	.44									1.73	2.08
30	1.65	1.34	2.40	.45									1.79	2.16
35	1.67	1.35	2.40	.45									1.80	2.17
40	1.69	1.37	2.55	.48									1.85	2.23
45	1.72	1.39	2.65	.50									1.89	2.28
50	1.76	1.43	2.67	.50									1.93	2.32
55	1.79	1.46	2.70	.51									1.96	2.36
2300	1.84	1.49	2.74	.52									2.01	2.42
15	1.89	1.53	2.75	.52									2.05	2.47
30	1.90	1.54	2.75	.52									2.06	2.48
2400	1.90	1.54	2.75	.52									2.06	2.48

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
										WMR:	

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation =

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

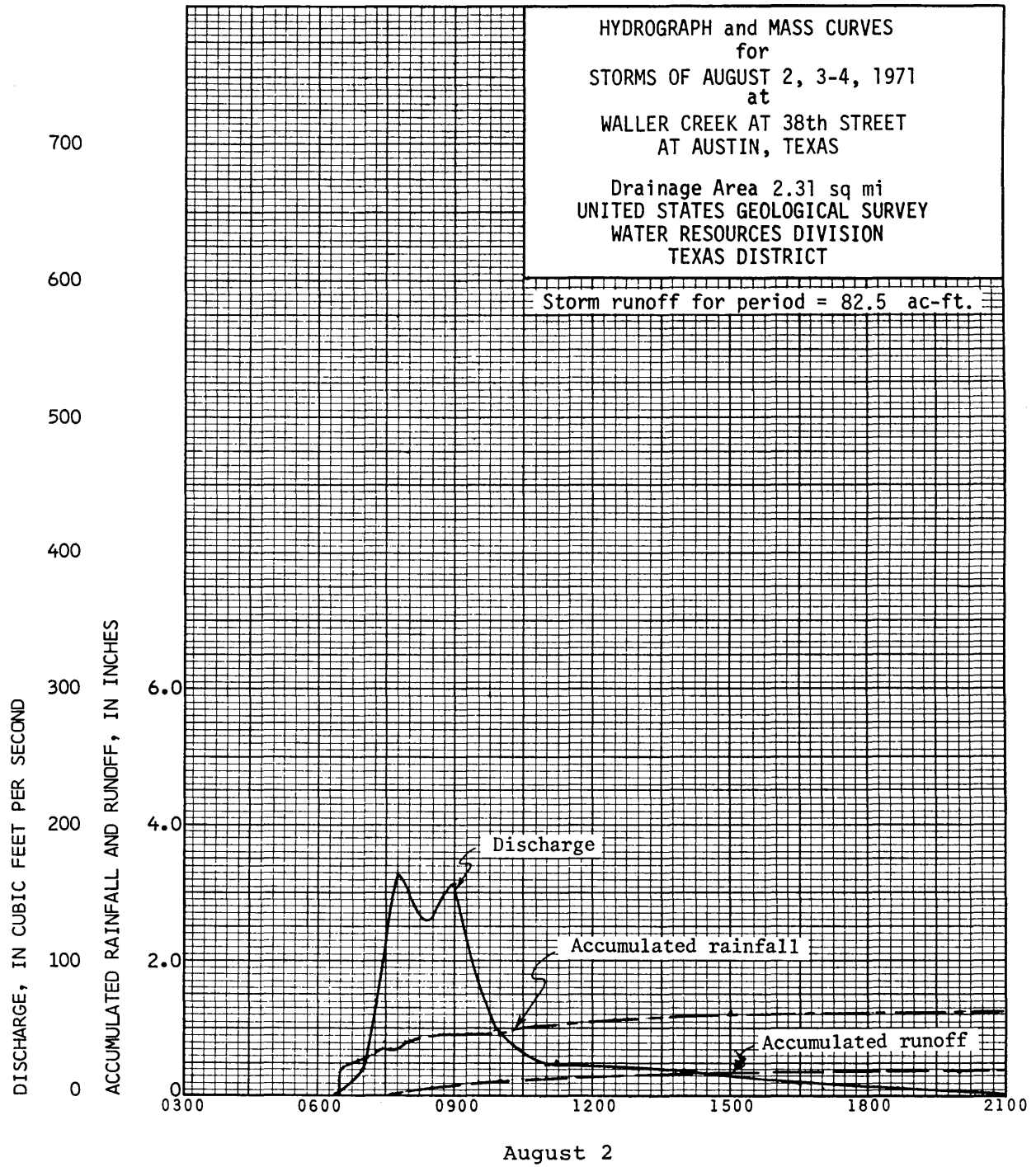
Sheet 7 of 7
Comp. by: FHT
Date 12/15/71
Check by EEW
Date 2/23/72

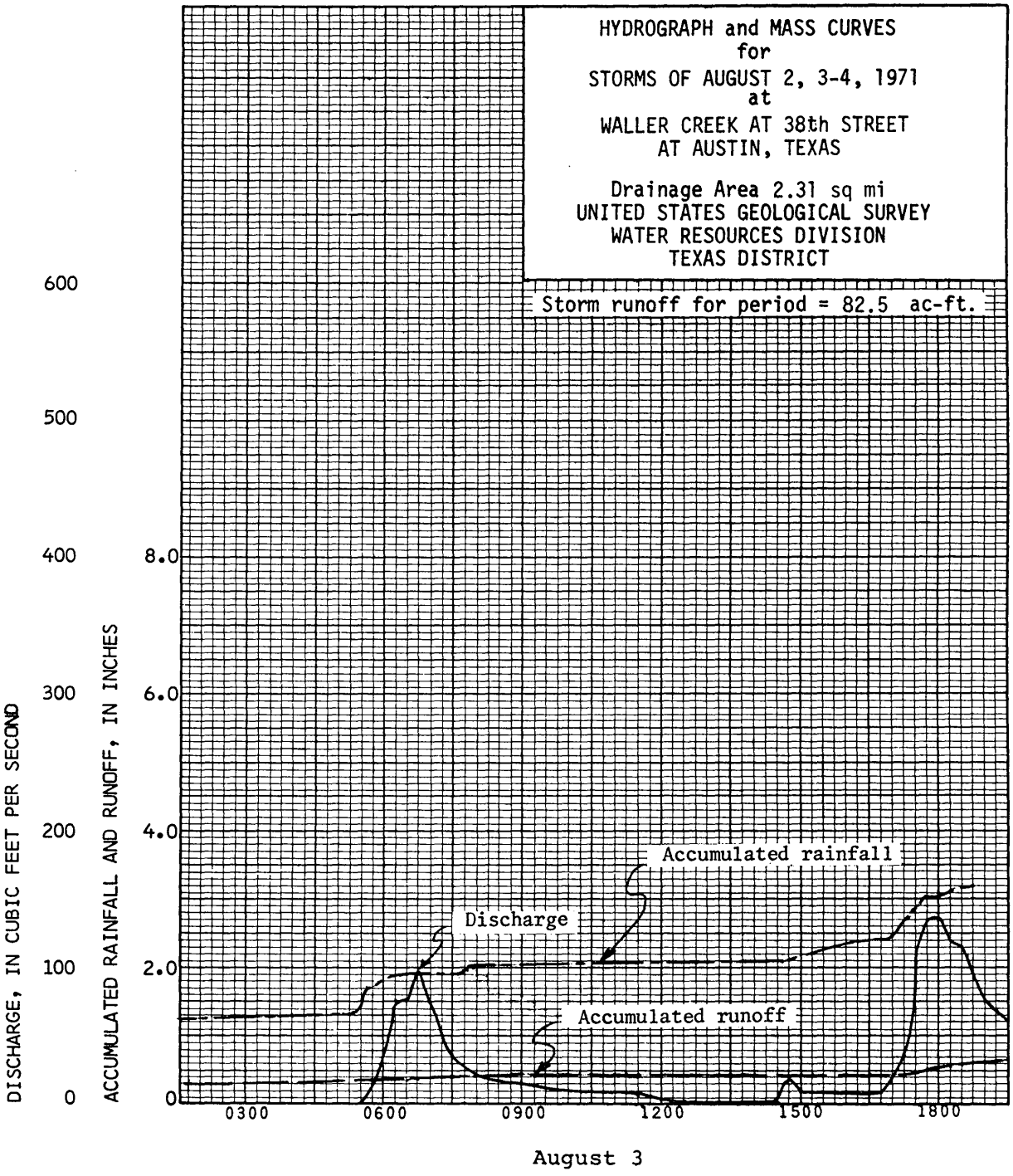
Study Area WALLER CREEK at 38th STREET, AUSTIN, TEX Date of storm Aug 2-4, 1971

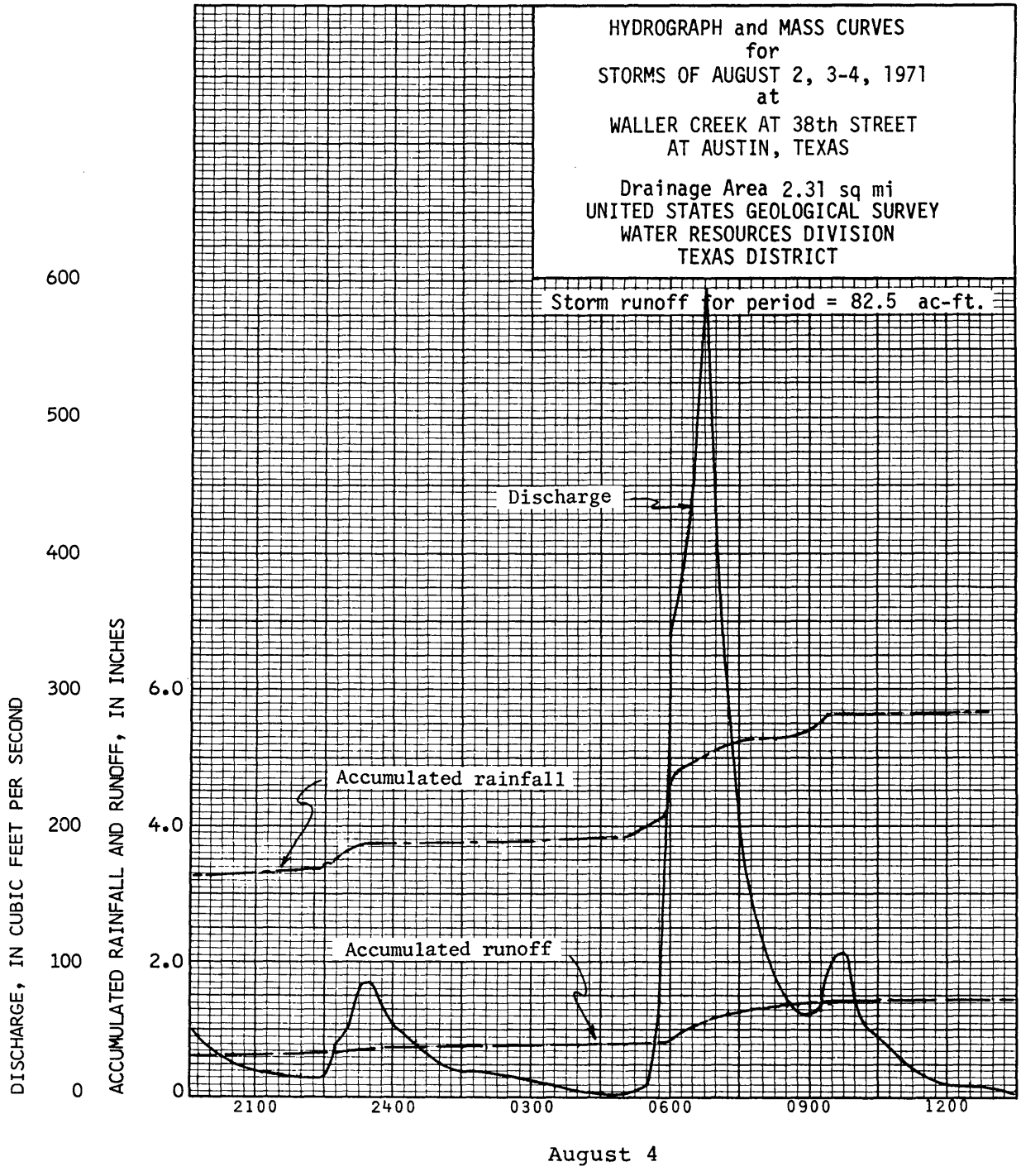
Weight Factor	Accumulated Precipitation in Inches for Recording Rain Gages										Accumulated Weighted Precipitation	
	.811		.189									
Date & Time	Gage 4-R Recorded	x Factor	Gage 5-R Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	Recording Gages All Gages	(Rec. Gages x K) All Gages
Aug. 4, 1971														
0445	1.95	1.58	2.80	.53									2.11	2.54
55	1.96	1.59	2.85	.54									2.13	2.56
0500	1.97	1.60	2.90	.55									2.15	2.59
15	2.09	1.69	2.95	.56									2.25	2.71
30	2.17	1.76	2.96	.56									2.32	2.79
45	2.19	1.78	3.25	.61									2.39	2.88
50	2.24	1.82	3.27	.62									2.44	2.94
55	2.49	2.02	3.40	.64									2.66	3.20
0600	2.59	2.10	3.52	.67									2.77	3.34
05	2.66	2.16	3.58	.68									2.84	3.42
10	2.74	2.22	3.60	.68									2.90	3.49
15	2.84	2.30	3.62	.68									2.98	3.59
30	2.94	2.38	3.69	.70									3.08	3.71
45	2.99	2.42	3.77	.71									3.13	3.77
0700	3.06	2.48	3.85	.73									3.21	3.86
15	3.09	2.51	3.90	.74									3.25	3.91
30	3.12	2.53	3.95	.75									3.28	3.95
45	3.13	2.54	3.99	.75									3.29	3.96
0800	3.15	2.55	4.01	.76									3.31	3.99
30	3.21	2.60	4.05	.77									3.37	4.06
0900	3.24	2.71	4.10	.77									3.48	4.19
15	3.51	2.85	4.11	.78									3.63	4.37
30	3.52	2.85	4.12	.78									3.63	4.37
1000	3.52	2.85	4.14	.78									3.63	4.37
1100	3.52	2.85	4.14	.78									3.63	4.37

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
1-S	.360	4.75	1.71								
2-S	.006	3.62	.02								
3-S	.338	4.71	1.59								
4-R	.287	3.52	1.01								
5-R	.009	4.14	.04								
										WMR:	4.37

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation = 4.37/3.63 = 1.204


HYDROGRAPH and MASS CURVES
for
STORMS OF AUGUST 2, 3-4, 1971
at
WALLER CREEK AT 38th STREET
AT AUSTIN, TEXAS
Drainage Area 2.31 sq mi
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT
Storm runoff for period = 82.5 ac-ft.
DISCHARGE, IN CUBIC FEET PER SECOND
ACCUMULATED RAINFALL AND RUNOFF, IN INCHES
700
600
500
400
300
200
100
0
6.0
4.0
2.0
0
Discharge
Accumulated rainfall
Accumulated runoff
0300
0600
0900
1200
1500
1800
2100
August 2


HYDROGRAPH and MASS CURVES
for
STORMS OF AUGUST 2, 3-4, 1971
at
WALLER CREEK AT 38th STREET
AT AUSTIN, TEXAS
Drainage Area 2.31 sq mi
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT
Storm runoff for period = 82.5 ac-ft.
DISCHARGE, IN CUBIC FEET PER SECOND
ACCUMULATED RAINFALL AND RUNOFF, IN INCHES
600
500
400
300
200
100
0
8.0
6.0
4.0
2.0
0
Discharge
Accumulated rainfall
Accumulated runoff
0300
0600
0900
1200
1500
1800
August 3


HYDROGRAPH and MASS CURVES
for
STORMS OF AUGUST 2, 3-4, 1971
at
WALLER CREEK AT 38th STREET
AT AUSTIN, TEXAS
Drainage Area 2.31 sq mi
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT
Storm runoff for period = 82.5 ac-ft.
Discharge
Accumulated rainfall
Accumulated runoff
DISCHARGE, IN CUBIC FEET PER SECOND
ACCUMULATED RAINFALL AND RUNOFF, IN INCHES
600
500
400
300
200
100
0
6.0
4.0
2.0
0
2100
2400
0300
0600
0900
1200
August 4

TX.-65 (Rev. 7-69)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station Waller Creek at 23rd Street, Austin, Texas

Period of Record June 21-22, 1971 Drainage Area 4.13

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Discharge Inc.	Discharge In/Hr.	Runoff Inches	Runoff Acc. In.
June 21, 1971							
0000	1.08	0	1.1	189	.0004	.0031	.0031
1545				190	.0004	.0032	.0063
50				2	.0004	.0000	.0063
55					.0004	.0000	.0063
1600	1.08				.0004	.0000	.0063
05	1.09		1.1		.0004	.0000	.0063
10	1.39		3.5		.0013	.0001	.0064
15	2.30		57		.0214	.0018	.0082
20	3.92		442		.1658	.0138	.0220
25	5.50		1,200		.4500	.0375	.0595
30	6.00		1,500		.5625	.0469	.1064
35	6.08		1,560		.5850	.0487	.1551
40	5.60		1,260		4725	.0394	.1945
45	5.07		958		3592	.0299	.2244
50	4.80		820		3075	.0256	.2500
55	4.69		765	2	2869	.0239	.2739
1700	4.64		740	4	2775	.0463	.3202
15	4.07		499	6	1871	.0468	.3670
30	3.71		366		1372	.0343	.4013
45	3.43		280		1050	.0262	.4275
1800	3.14		203		0761	.0190	.4465
15	2.88		147		0551	.0138	.4603
30	2.68		112		0420	.0105	.4708
45	2.64		105		0394	.0098	.4806
1900	2.58		96		0360	.0090	.4896
15	2.41		70		0262	.0066	.4962
30	2.30	0	57	6	0214	.0054	.5016
1945	2.19	0	44	6	0165	.0041	.5057
2000	2.11		36		0135	.0034	.5091
15	2.02		29		0109	.0027	.5118
30	1.96		24		0090	.0022	.5140
45	1.92		21	6	0079	.0020	.5160
2100	1.89		20	9	0075	.0028	.5188
30	1.84		17	12	0064	.0032	.5220
2200	1.79		14		0052	.0026	.5246
30	1.73		12		0045	.0022	.5268
2300	1.65		8.8		0033	.0016	.5284
30	1.58		6.8	12	0026	.0013	.5297
2400	1.52	0	5.6	6	0021	.0005	.5302
June 22, 1971							
0000	1.52	0	5.6	3	0021	.0032	.5334
0300	1.28		2.3	6	0009	.0027	.5361
0600	1.18		1.6	21	0006	.0126	.5487
2400	1.11	0	1.2	18	0004	.0036	.5523

Computed by B.T.B III - FHT Date 7/14/71 Checked by EEW Date 7/14/71

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

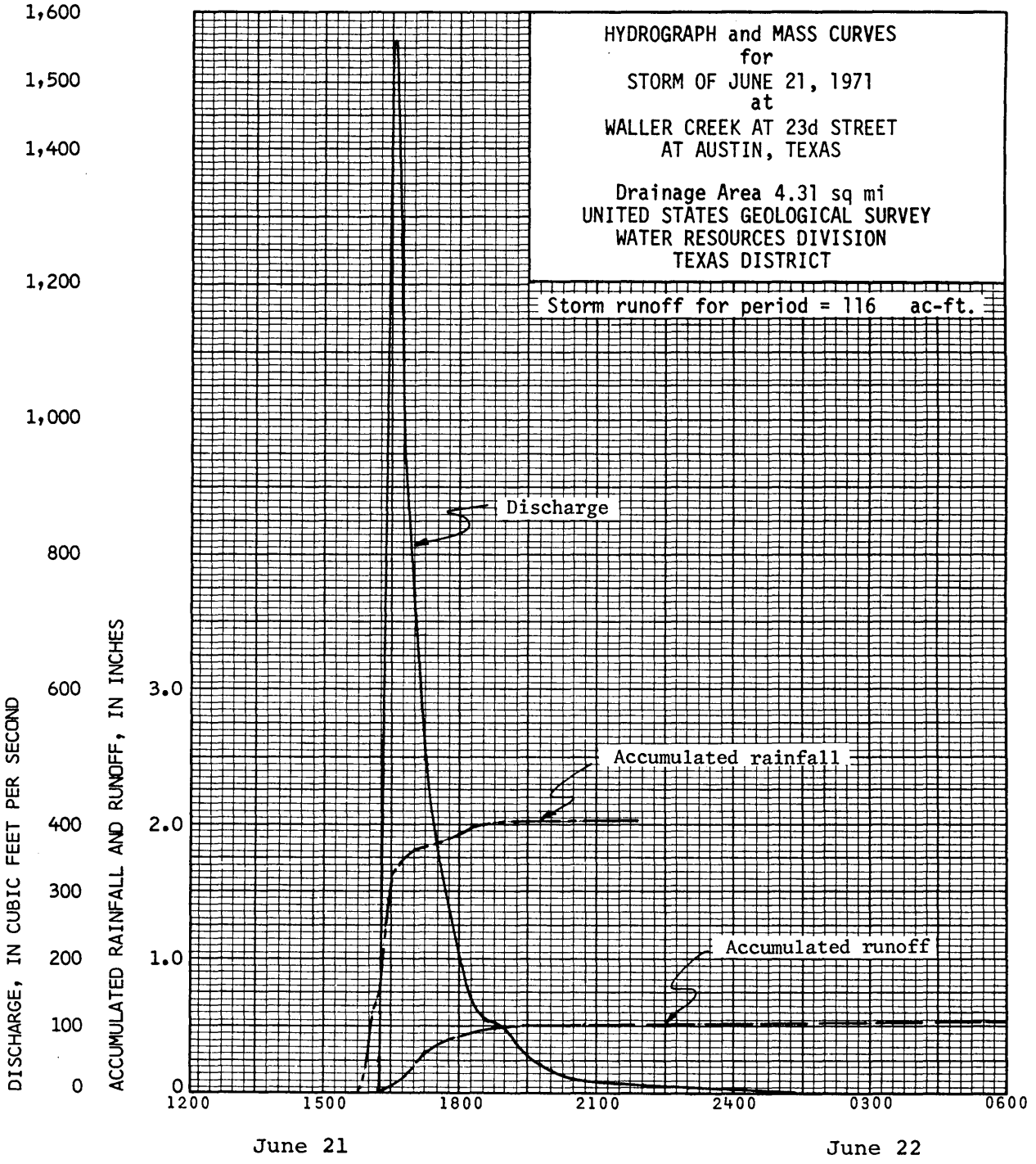
Sheet 1 of 1
Comp. by: BTB - FHT
Date 7/14/71 - 1/24/72
Check by EEW
Date 7/14/71

Study Area Waller Creek at 23rd Street, Austin, Tex. Date of storm June 21, 1971

Accumulated Precipitation in Inches for Recording Rain Gages													Accumulated Weighted Precipitation	
Weight Factor	.508		.396		.096									
Date & Time	Gage 4-R Recorded	x Factor	Gage 5-R Recorded	x Factor	Gage 6-R Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	Recording Gages (Rec. Gages x K)	All Gages
June 21, 1971														
0000	0	0	0	0	0	0							0	0
1545	0	0	0	0	0	0							0	0
50	0	0	.13	.05	0	0							.05	.05
55	0	0	.53	.21	0	0							.21	.19
1660	0	0	1.10	.44	0	0							.44	.40
05	.03	.02	1.60	.63	0	0							.65	.59
10	.20	.10	1.71	.68	.08	.01							.79	.72
15	.55	.28	1.80	.71	.45	.04							1.03	.94
20	.97	.49	1.82	.72	1.25	.12							1.33	1.22
25	1.28	.65	1.91	.76	1.74	.17							1.58	1.44
30	1.48	.75	1.98	.78	1.86	.18							1.71	1.56
35	1.55	.79	2.09	.83	1.92	.18							1.80	1.65
40	1.60	.81	2.11	.84	2.06	.20							1.85	1.69
45	1.64	.83	2.12	.84	2.16	.21							1.88	1.72
50	1.72	.87	2.17	.84	2.21	.21							1.92	1.76
55	1.76	.89	2.13	.84	2.31	.22							1.95	1.78
1700	1.80	.91	2.13	.84	2.36	.23							1.98	1.81
15	1.82	.92	2.13	.84	2.38	.23							1.99	1.82
30	1.85	.94	2.18	.86	2.39	.23							2.03	1.86
45	1.88	.96	2.22	.88	2.42	.23							2.07	1.89
1800	1.92	.98	2.27	.90	2.44	.23							2.11	1.93
15	1.96	1.00	2.32	.92	2.49	.24							2.16	1.98
30	1.98	1.01	2.35	.93	2.54	.24							2.18	1.99
45	2.00	1.02	2.36	.93	2.59	.25							2.20	2.01
1900	2.01	1.02	2.37	.94	2.61	.25							2.21	2.02
15	2.02	1.03	2.37	.94	2.63	.25							2.22	2.03
30	2.02	1.03	2.37	.94	2.64	25							2.22	2.03

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
1-5	.264	2.25	.59								
2-5	.101	1.86	.19								
3-5	.190	1.16	.22								
4-R	.161	2.02	.33								
5-R	.187	2.37	.44								
6-R	097	2.64	.26							WMR:	2.03

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation = 203/222 = .9144


HYDROGRAPH and MASS CURVES
for
STORM OF JUNE 21, 1971
at
WALLER CREEK AT 23d STREET
AT AUSTIN, TEXAS
Drainage Area 4.31 sq mi
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT
Storm runoff for period = 116 ac-ft.
Discharge
Accumulated rainfall
Accumulated runoff
DISCHARGE, IN CUBIC FEET PER SECOND
ACCUMULATED RAINFALL AND RUNOFF, IN INCHES
1,600
1,500
1,400
1,200
1,000
800
600
400
300
200
100
0
3.0
2.0
1.0
0
1200
1500
1800
2100
2400
0300
0600
June 21
June 22

TX.-65 (Rev.7-69)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station WALLER CREEK at 23d St., AUSTIN, TEX.

Period of Record July 26-27, 1971 Drainage Area 4.13

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Inc.	In/Hr.	Runoff Inches	Acc. In.
	July 26, 1971						
0000	1.00	0	.78	86	.0003	.0032	.0032
2130	1.00		.78	87	.0003	.0033	.0065
45	1.69		10	2	.0038	.0010	.0075
2200	3.34		254	2	.0952	.0238	.0313
15	4.65		745	2	.2794	.0698	.1011
30	4.96		900	2	.3375	.0844	.1855
45	3.96		457	2	.1714	.0428	.2283
2300	3.87		423	2	.1586	.0396	.2679
15	3.29		240	2	.0900	.0225	.2904
30	3.05		182	2	.0682	.0170	.3074
45	2.82		137	2	.0514	.0128	.3202
2400	2.63	0	104	1	.0390	.0049	.3251
	July 27, 1971						
0000	2.63	0	104	1	.0390	.0049	.3300
15	2.55		91	2	.0341	.0085	.3385
30	2.40		69	2	.0259	.0065	.3450
45	2.29		56	2	.0210	.0052	.3502
0100	2.21		46	2	.0172	.0043	.3545
15	2.14		39	2	.0146	.0036	.3581
30	2.05		31	2	.0116	.0029	.3610
45	1.99		26	2	.0098	.0024	.3634
0200	1.96		24	2	.0090	.0022	.3656
15	1.93		22	2	.0082	.0020	.3676
30	1.90		20	2	.0075	.0019	.3695
45	1.87		18	2	.0068	.0017	.3712
0300	1.84	0	17	2	.0064	.0016	.3728

Time	G. Ht. Feet	Sh. Adj.	Discharge C.f.s.	Inc.	In/Hr.	Runoff Inches	Acc. In
	July 27, 1971 (CONTINUED)						
0315	1.82	0	16	2	.0060	.0015	.3743
30	1.79		14	2	.0052	.0013	.3756
45	1.76		13	2	.0049	.0012	.3768
0400	1.74		12	3	.0045	.0017	.3785
30	1.68		9.8	4	.0037	.0018	.3803
0500	1.62		7.9	4	.0030	.0015	.3818
30	1.55		6.2	4	.0023	.0011	.3829
0600	1.48		4.8	4	.0018	.0009	.3838
30	1.42		3.9	4	.0015	.0008	.3846
0700	1.38		3.4	6	.0013	.0010	.3856
0800	1.32		2.7	12	.0010	.0015	.3871
1000	1.23		1.9	16	.0007	.0014	.3885
1200	1.17		1.5	16	.0006	.0012	.3897
1400	1.11		1.2	16	.0004	.0008	.3905
1600	1.09		1.1	16	.0004	.0008	.3913
1800	1.06		1.0	16	.0004	.0008	.3921
2000	1.07		1.1	12	.0004	.0006	.3927
2100	1.13		1.3	8	.0005	.0005	.3932
2200	1.18		1.6	8	.0006	.0006	.3938
2300	1.35		3.0	8	.0011	.0011	.3949
2400	1.59	0	7.1	4	.0027	.0014	.3963

Computed by EHT Date 12/15/71 Checked by EEW Date 12/20/71

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

Sheet 1 of 2
Comp. by: EHT
Date 12/7/71
Check by EEW
Date 12/7/71

Study Area Waller Creek at 23 & Street, Austin, Tex Date of storm July 26-27, 1971

Accumulated Precipitation in Inches for Recording Rain Gages												Accumulated Weighted Precipitation	
Weight Factor	.508		.396		.096								
	Gage 4-R		Gage 5-R		Gage 6-R		Gage		Gage		Gage		
Date & Time	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recording Gages	(Rec. Gages x K) All Gages
July 26, 1971														
2130	0	0	0	0	0	0							0	0
35	0	0	.02	.01	0	0							.01	.01
40	0	0	.09	.04	0	0							.04	.04
45	0	0	.22	.09	0	0							.09	.09
50	0	0	.37	.15	0	0							.15	.15
55	0	0	.72	.29	0	0							.29	.29
2200	0	0	1.00	.40	0	0							.40	.40
05	.01	.01	1.17	.46	.05	0							.47	.46
10	.02	.01	1.42	.56	.12	.01							.58	.57
15	.10	.05	1.47	.58	.20	.02							.65	.64
20	.25	.13	1.52	.60	.40	.04							.77	.76
25	.45	.23	1.59	.63	.70	.07							.93	.92
30	.68	.35	1.67	.66	1.00	.10							1.11	1.10
35	.76	.39	1.82	.72	1.20	.12							1.23	1.22
40	.80	.41	1.87	.74	1.70	.16							1.31	1.29
45	.90	.46	1.90	.75	1.90	.18							1.39	1.37
2300	.95	.48	1.92	.76	2.23	.21							1.45	1.43
05	.95	.48	1.92	.76	2.28	.22							1.46	1.44
10	.96	.49	1.92	.76	2.32	.22							1.47	1.45
15	.97	.49	1.92	.76	2.39	.23							1.48	1.46
20	.97	.49	1.92	.76	2.42	.23							1.48	1.46
25	.98	.50	1.92	.76	2.50	.24							1.50	1.48
30	.98	.50	1.92	.76	2.52	.24							1.50	1.48
45	.99	.50	1.92	.76	2.55	.24							1.50	1.48
2400	1.00	.51	1.94	.77	2.58	.25							1.53	1.51
July 27, 1971														
0015	1.02	.52	1.97	.78	2.59	.25							1.55	1.53

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
										WMR:	

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation =

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

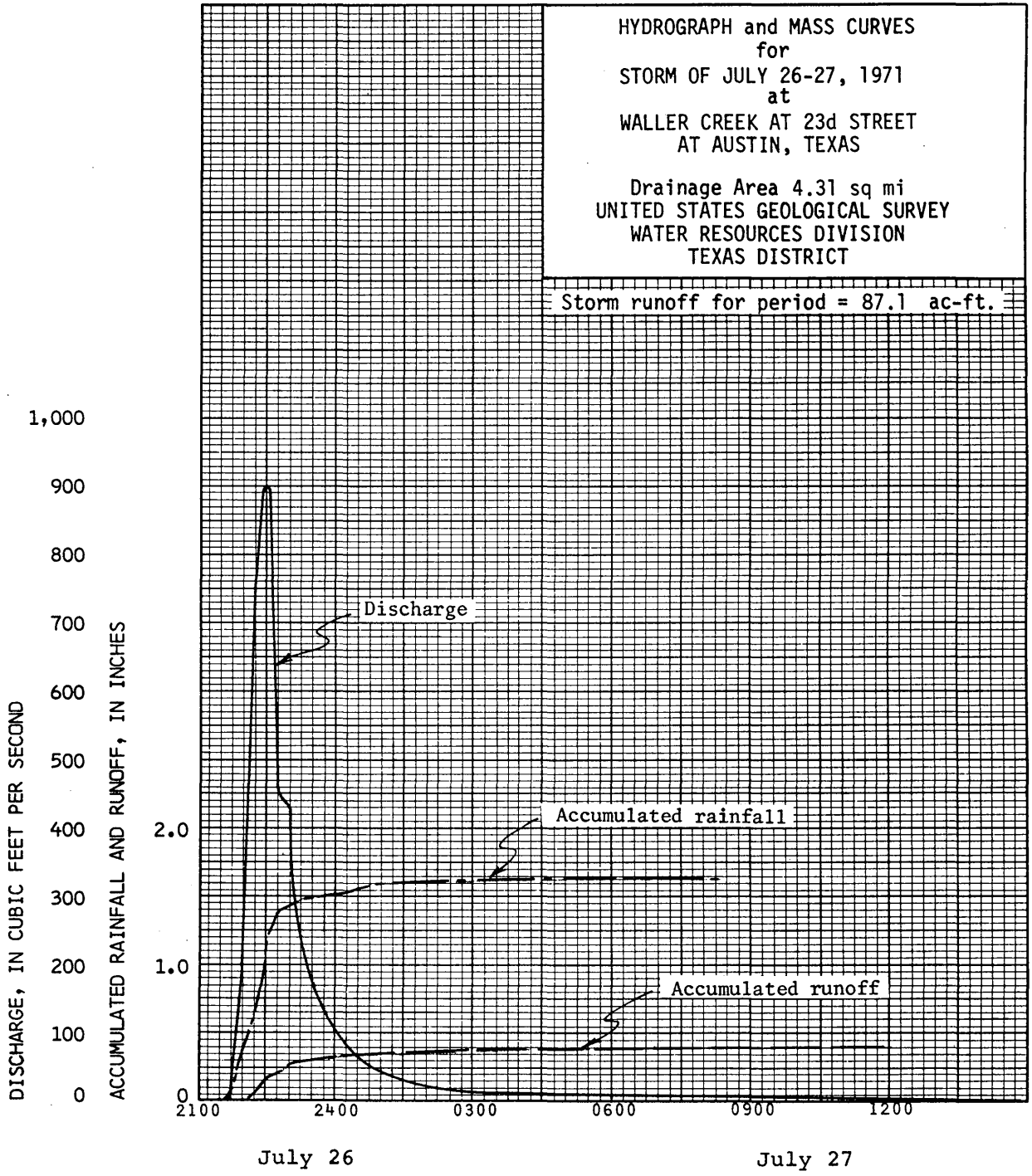
Comp. by: EHT
Date 12/7/71
Check by EEW
Date 12/7/71

Study Area Waller Creek at 23rd Street, Austin, Tex. Date of storm July 26-27, 1971

Weight Factor		.508		.396		.096								Accumulated Weighted Precipitation	
		Gage 4-R		Gage 5-R		Gage 6-R		Gage		Gage		Gage		Recording Gages	(Rec. Gages x K)
Date & Time		Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	All Gages	All Gages
July 27, 1971	(Continued)														
	0030	1.08	.55	1.98	.78	2.59	.25							1.58	1.56
	45	1.09	.55	2.01	.80	2.60	.25							1.60	1.58
	0100	1.11	.56	2.01	.80	2.61	.25							1.61	1.59
	30	1.11	.56	2.01	.80	2.62	.25							1.61	1.59
	0200	1.11	.56	2.02	.80	2.69	.26							1.62	1.60
	30	1.11	.56	2.02	.80	2.70	.26							1.62	1.60
	0300	1.12	.57	2.02	.80	2.71	.26							1.63	1.61
	0500	1.15	.58	2.02	.80	2.72	.26							1.64	1.62
	0600	1.16	.59	2.02	.80	2.73	.26							1.65	1.63
	0700	1.16	.59	2.02	.80	2.73	.26							1.65	1.63
	1200	1.16	.59	2.02	.80	2.73	.26							1.65	1.63

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
1-S	.264	1.74	.46								
2-S	.101	1.58	.16								
3-S	.190	.95	.18								
4-R	.161	1.16	.19								
5-R	.187	2.02	.38								
6-R	.097	2.73	.26							WMR:	1.63

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation = 1.63/1.65 = .9879


HYDROGRAPH and MASS CURVES
for
STORM OF JULY 26-27, 1971
at
WALLER CREEK AT 23d STREET
AT AUSTIN, TEXAS
Drainage Area 4.31 sq mi
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT
Storm runoff for period = 87.1 ac-ft.
DISCHARGE, IN CUBIC FEET PER SECOND
ACCUMULATED RAINFALL AND RUNOFF, IN INCHES
1,000
900
800
700
600
500
400
300
200
100
0
2.0
1.0
0
Discharge
Accumulated rainfall
Accumulated runoff
2100
2400
0300
0600
0900
1200
July 26
July 27

TX.-65 (Rev. 7-69)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station WALLER CREEK at 23 d st., AUSTIN, TEX.

Period of Record Aug 2-4, 1971 Drainage Area 4.13

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Discharge Inc.	Discharge In/Hr.	Runoff Inches	Runoff Acc. In.
Aug 2, 1971							
0000	1.20	0	1.7	4	.0006	.0003	.0003
0100	1.15		1.4	8	.0005	.0005	.0008
0200	1.07		1.1	16	.0004	.0008	.0016
0500	1.03		.88	16	.0003	.0006	.0022
0600	1.10		1.2	5	.0004	.0002	.0024
15	1.39		3.5	2	.0013	.0003	.0087
30	1.96		24	2	.0090	.0022	.0049
45	2.61		101	2	.0379	.0095	.0144
0700	2.63		104	2	.0390	.0098	.0242
15	2.49		82	2	.0308	.0077	.0319
30	3.09		191	2	.0716	.0179	.0498
45	3.19		215	2	.0806	.0201	.0699
0800	3.23		225	2	.0844	.0211	.0910
15	3.26		217	2	.0814	.0204	.1114
30	3.08		189	2	.0709	.0177	.1291
45	2.94		159	2	.0596	.0149	.1440
0900	2.98		167	3	.0626	.0235	.1675
30	2.69		113	4	.0424	.0212	.1887
1000	2.37		65	4	.0244	.0122	.2009
30	2.25		51	4	.0191	.0096	.2105
1100	2.19		44	4	.0165	.0082	.2187
30	2.16		41	4	.0154	.0077	.2264
1200	2.15		40	4	.0150	.0075	.2339
30	2.13		38	4	.0142	.0071	.2410
1300	2.07		33	10	.0124	.0155	.2565
1500	1.92		21	16	.0079	.0158	.2723
1700	1.73	0	12	16	.0045	.0090	.2813
1900	1.52	0	5.6	16	.0021	.0041	.2854
2100	1.37		3.2	16	.0012	.0024	.2878
2300	1.26		2.2	12	.0008	.0012	.2890
2400	1.22	0	1.9	4	.0007	.0004	.2894
Aug 3, 1971							
0000	1.22	0	1.9	4	.0007	.0004	.2898
0100	1.18		1.6	12	.0006	.0009	.2907
0300	1.12		1.3	16	.0005	.0010	.2917
0500	1.10		1.2	9	.0004	.0004	.2921
15	1.97		25	2	.0094	.0024	.2945
30	2.89		149	3	.0559	.0210	.3155
0600	2.40		69	3	.0259	.0097	.3252
15	2.25		51	2	.0191	.0048	.3300
30	2.51		85	2	.0319	.0080	.3380
45	2.49		82	3	.0308	.0116	.3496
0715	2.38		67	3	.0251	.0094	.3590
30	2.23		49	2	.0184	.0046	.3636
45	2.11		36	2	.0135	.0034	.3670
0800	2.01		28	2	.0105	.0026	.3696
15	1.93		22	4	.0082	.0041	.3737
0900	1.84		17	5	.0064	.0040	.3777
30	1.80		15	4	.0056	.0028	.3805
1000	1.75		13	6	.0049	.0037	.3842
1100	1.67		9.5	8	.0036	.0036	.3878
1200	1.62		7.9	8	.0030	.0030	.3908
1300	1.50	0	5.2	8	.0020	.0020	.3928

Aug 2, 1971 (CONTINUED)

Computed by FHT Date 12/15/71 Checked by EEW - BTB III Date 1/13/72

TX.-65 (Rev.7-69)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station WALLER CREEK at 23rd St, AUSTIN, TEX

Period of Record Aug 2-4, 1971 Drainage Area 4.13

Time	G. Ht. Feet	Sh. Adj.	Discharge C.f.s.	Discharge Inc.	Discharge In/Hr.	Runoff Inches	Runoff Acc. In.
1400	1.42	o	3.9	6	.0015	.0011	.3939
30	1.39		3.5	3	.0013	.0005	.3944
45	2.19		44	2	.0165	.0041	.3985
1500	2.43		73	2	.0274	.0068	.4053
15	2.15		40	2	.0150	.0038	.4091
30	2.01		28	2	.0105	.0026	.4117
45	1.86		18	4	.0068	.0034	.4151
1630	1.77		13	4	.0049	.0024	.4175
45	2.17		42	2	.0158	.0040	.4215
1700	2.67		110	2	.0412	.0103	.4318
15	3.14		203	2	.0761	.0190	.4508
30	3.32		249	3	.0934	.0350	.4858
1800	3.25		230	4	.0862	.0431	.5289
30	3.07		186	4	.0698	.0349	.5638
1900	2.72		119	6	.0446	.0334	.5972
2000	2.28		55	8	.0206	.0206	.6178
2100	1.98		26	6	.0098	.0074	.6252
30	1.90		20	3	.0075	.0028	.6280
45	2.08		33	2	.0124	.0031	.6311
2200	2.32		59	2	.0221	.0055	.6366
15	2.28		55	2	.0206	.0052	.6418
30	2.81		135	2	.0506	.0126	.6544
45	3.21		220	2	.0825	.0206	.6750
2300	3.15		205	2	.0769	.0192	.6942
15	2.92		155	2	.0581	.0145	.7087
30	2.77		128	2	.0480	.0120	.7207
45	2.63	o	104	2	.0390	.0098	.7305

Time	G. Ht. Feet	Sh. Adj.	Discharge C.f.s.	Discharge Inc.	Discharge In/Hr.	Runoff Inches	Runoff Acc. In
	Aug 3, 1971 (CONTINUED)						
2400	2.47	o	79	1	.0296	.0037	.7342
	Aug 4, 1971						
0000	2.47	o	79	2	.0296	.0074	.7416
30	2.32		59	4	.0221	.0110	.7526
0100	2.15		40	4	.0150	.0075	.7601
30	1.98		26	4	.0098	.0049	.7650
0200	1.91		21	4	.0079	.0040	.7690
30	1.86		18	4	.0068	.0034	.7724
0300	1.81		15	4	.0056	.0028	.7752
30	1.75		13	4	.0049	.0024	.7776
0400	1.70		10	5	.0038	.0024	.7800
45	1.62		7.9	4	.0030	.0015	.7815
0500	1.94		23	2	.0086	.0022	.7837
15	2.04		30	2	.0112	.0028	.7865
30	2.44		75	2	.0281	.0070	.7935
45	3.40		271	2	.1016	.0254	.8189
0600	4.56		702	2	.2632	.0658	.8847
15	4.60		720	2	.2700	.0675	.9522
30	4.44		648	2	.2430	.0608	1.0130
45	4.77		805	2	.3019	.0755	1.0885
0700	4.72		780	2	.2925	.0731	1.1616
15	4.20		550	2	.2062	.0516	1.2132
30	3.77		388	2	.1455	.0364	1.2496
45	3.41		274	2	.1028	.0257	1.2753
0800	3.11		195	2	.0731	.0183	1.2936
15	2.89	o	149	2	.0559	.0140	1.3076

Computed by FHT Date 12/15/71 Checked by EEW - BTB III Date 1/13/72

TX.-65 (Rev. 7-69)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station WALLER CREEK at 23 d st, AUSTIN, TEX

Period of Record Aug 2-4, 1971 Drainage Area 4.13

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Discharge Inc.	Discharge In/Hr.	Runoff Inches	Runoff Acc. In.
	Aug 4, 1971						
0830	2.71	0	117	2	.0439	.0110	1.3186
45	2.59		97	2	.0364	.0091	1.3277
0900	2.58		96	2	.0360	.0090	1.3367
15	2.63		104	2	.0390	.0098	1.3465
30	2.57		94	2	.0352	.0088	1.3553
45	2.72		119	2	.0446	.0112	1.3665
1000	2.64		105	3	.0394	.0148	1.3813
30	2.33		61	4	.0229	.0114	1.3927
1100	2.15		40	4	.0150	.0075	1.4002
30	1.99		26	4	.0098	.0049	1.4051
1200	1.87		18	4	.0068	.0034	1.4085
30	1.80		15	4	.0056	.0028	1.4113
1300	1.75		13	4	.0049	.0024	1.4137
30	1.70		10	4	.0038	.0019	1.4156
1400	1.66		9.2	4	.0034	.0017	1.4173
30	1.62		7.9	4	.0030	.0015	1.4188
1500	1.61		7.6	6	.0028	.0021	1.4209
1600	1.58		6.9	12	.0026	.0039	1.4248
1800	1.52		5.6	16	.0021	.0042	1.4290
2000	1.50		5.2	16	.0020	.0040	1.4330
2200	1.47		4.7	16	.0018	.0036	1.4366
2400	1.43	0	4.1	8	.0015	.0015	1.4381

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Discharge Inc.	Discharge In/Hr.	Runoff Inches	Runoff Acc. In

Computed by FHT Date 12/15/71 Checked by EEW - BTB III Date 1/13/72

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

Sheet 1 of 4
Comp. by: FHT
Date 12/14/71
Check by EEW
Date 2/15/72

Study Area WALLER CREEK at 23rd ST., AUSTIN, TEX. Date of storm Aug 2, 3, 4, 1971

	Accumulated Precipitation in Inches for Recording Rain Gages												Accumulated Weighted Precipitation	
Weight Factor	.508		.396		.096									
	Gage 4-R		Gage 5-R		Gage 6-R		Gage		Gage		Gage		Recording Gages	(Rec. Gages x K)
Date & Time	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	All Gages	All Gages
Aug 2, 1971														
0600	0	0	0	0	0	0							0	0
05	0	0			.61	0							0	0
10	0	0			.10	.01							.01	.01
15	0	0			.19	.02							.02	.02
20	.05	.03			.19	.02							.05	.06
25	.25	.13			.23	.02							.15	.17
30	.37	.19			.26	.02							.21	.23
35	.50	.25			.27	.03							.28	.31
40	.55	.28			.29	.03							.31	.34
45	.57	.29			.30	.03							.32	.35
0700	.62	.31			.30	.03							.34	.38
15	.67	.34			.31	.05							.39	.43
30	.75	.38			.56	.05							.43	.48
35	.71	.39			.57	.05							.44	.49
40	.85	.43			.60	.06							.49	.54
45	.92	.47			.61	.06							.53	.59
0800	1.00	.51			.69	.07							.58	.64
0930	1.05	.53			.70	.07							.60	.66
1000	1.10	.56			.76	.07							.63	.70
30	1.14	.58			.81	.08							.66	.73
1100	1.18	.60			.85	.08							.68	.75
30	1.23	.62			.90	.09							.71	.79
1200	1.26	.64			.94	.09							.73	.81
1300	1.34	.68			1.02	.10							.78	.86
1400	1.35	.69			1.07	.10							.79	.87
1600	1.41	.72			1.08	.10							.82	.91
2400	1.41	.72	0	0	1.12	.11							.83	.92

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
										WMR:	

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation =

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

Sheet 2 of 4
Comp. by: FHT
Date 12/14/71
Check by E.E.W
Date 2/16/72

Study Area WALLER CREEK at 23 & ST, AUSTIN, TEX. Date of storm AUG 2-4, 1971

Accumulated Precipitation in Inches for Recording Rain Gages													Accumulated Weighted Precipitation	
Weight Factor	Gage .508 4-R		Gage .396 5-R		Gage .096 6-R		Gage		Gage		Gage		Recording Gages	(Rec. Gages x K)
Date & Time	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	All Gages	All Gages
AUG 3, 1971														
0200	1.41	.72	0	0	1.12	.11							.83	.92
0300	1.42	.72			1.12	.11							.83	.92
0500	1.45	.74			1.22	.12							.86	.95
15	1.48	.75			1.31	.13							.88	.97
20	1.53	.78			1.32	.13							.91	1.01
25	1.67	.85			1.33	.13							.98	1.08
30	1.77	.90			1.33	.13							1.03	1.14
35	1.80	.91			1.34	.13							1.04	1.15
40	1.86	.94			1.34	.13							1.07	1.18
45	1.89	.96			1.34	.13							1.09	1.21
50	1.92	.98			1.35	.13							1.11	1.23
55	1.95	.99			1.35	.13							1.12	1.24
0600	1.99	1.01			1.35	.13							1.14	1.26
15	2.04	1.04			1.35	.13							1.17	1.30
30	2.05	1.04			1.35	.13							1.17	1.30
0915	2.05	1.04			1.35	.13							1.17	1.30
20	2.10	1.07			135	.13							1.20	1.33
25	2.19	1.11	0	0	1.35	.13							1.24	1.37
30	2.19	1.11	.10	.04	135	.13							1.28	1.42
1430	2.19	1.11	.25	.10	135	.13							1.34	1.48
1445	2.19	1.11	.50	.20	1.35	.13							1.44	1.59
1500	2.24	1.14	1.00	.40	1.35	.13							1.67	1.85
1600	2.29	1.16	1.00	.40	135	.13							1.69	1.87
1646	2.30	1.17	1.00	.40	1.45	.14							1.71	1.89
50	2.30	1.17	1.05	.42	1.47	.14							1.73	1.92
55	2.30	1.17	1.28	.51	1.53	.15							1.83	2.03
1700	2.30	1.17	1.40	.55	1.54	.15							1.87	2.07

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
										WMR:	

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation =

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

Sheet 3 of 4
Comp. by: FHT
Date 12/14/71
Check by EEW
Date 2/16/72

Study Area WALLER CREEK at 23d St, AUSTIN, Tex. Date of storm Aug 2-4, 1971

Weight Factor	Accumulated Precipitation in Inches for Recording Rain Gages												Accumulated Weighted Precipitation	
	Gage 4-R		Gage 5-R		Gage 6-R		Gage		Gage		Gage		Recording Gages	(Rec. Gages x K)
Date & Time	.508 Recorded	x Factor	.396 Recorded	x Factor	.096 Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	All Gages	All Gages
Aug 3, 1971 (CONTINUED)														
1705	2.35	1.19	1.49	.59	1.57	.15							1.93	2.14
10	2.41	1.22	1.60	.63	1.59	.15							2.00	2.21
15	2.48	1.26	1.67	.66	1.60	.15							2.07	2.29
20	2.50	1.27	1.77	.70	1.63	.16							2.13	2.36
25	2.60	1.32	1.80	.71	1.64	.16							2.19	2.42
30	2.65	1.35	1.84	.73	1.64	.16							2.24	2.48
35	2.70	1.37	1.85	.73	1.65	.16							2.26	2.50
40	2.77	1.41	1.85	.73	1.68	.16							2.30	2.55
45	2.80	1.42	1.87	.74	1.72	.17							2.33	2.58
1800	2.85	1.45	2.00	.79	1.76	.17							2.41	2.67
30	2.90	1.47	2.12	.84	1.81	.17							2.48	2.75
1900	2.95	1.50	2.12	.84	1.81	.17							2.51	2.78
2100	2.98	1.51	2.20	.87	1.87	.18							2.56	2.83
2145	2.99	1.52	2.20	.87	2.02	.19							2.58	2.86
2200	3.00	1.52	2.30	.91	2.02	.19							2.62	2.90
15	3.00	1.52	2.35	.93	2.12	.20							2.65	2.93
30	3.06	1.55	2.40	.95	2.37	.23							2.73	3.02
35	3.08	1.56	2.40	.98	2.39	.23							2.77	3.07
40	3.10	1.57	2.55	1.01	2.39	.23							2.81	3.11
45	3.13	1.59	2.65	1.05	2.42	.23							2.87	3.18
50	3.17	1.61	2.67	1.06	2.44	.23							2.90	3.21
55	3.20	1.63	2.70	1.07	2.45	.24							2.94	3.25
2300	3.25	1.65	2.74	1.09	2.46	.24							2.98	3.30
15	3.30	1.68	2.75	1.09	2.46	.24							3.01	3.33
30	3.31	1.68	2.75	1.09	2.47	.24							3.01	3.33
2400	3.31	1.68	2.75	1.09	2.48	.24							3.01	3.33

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
										WMR:	

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation =

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

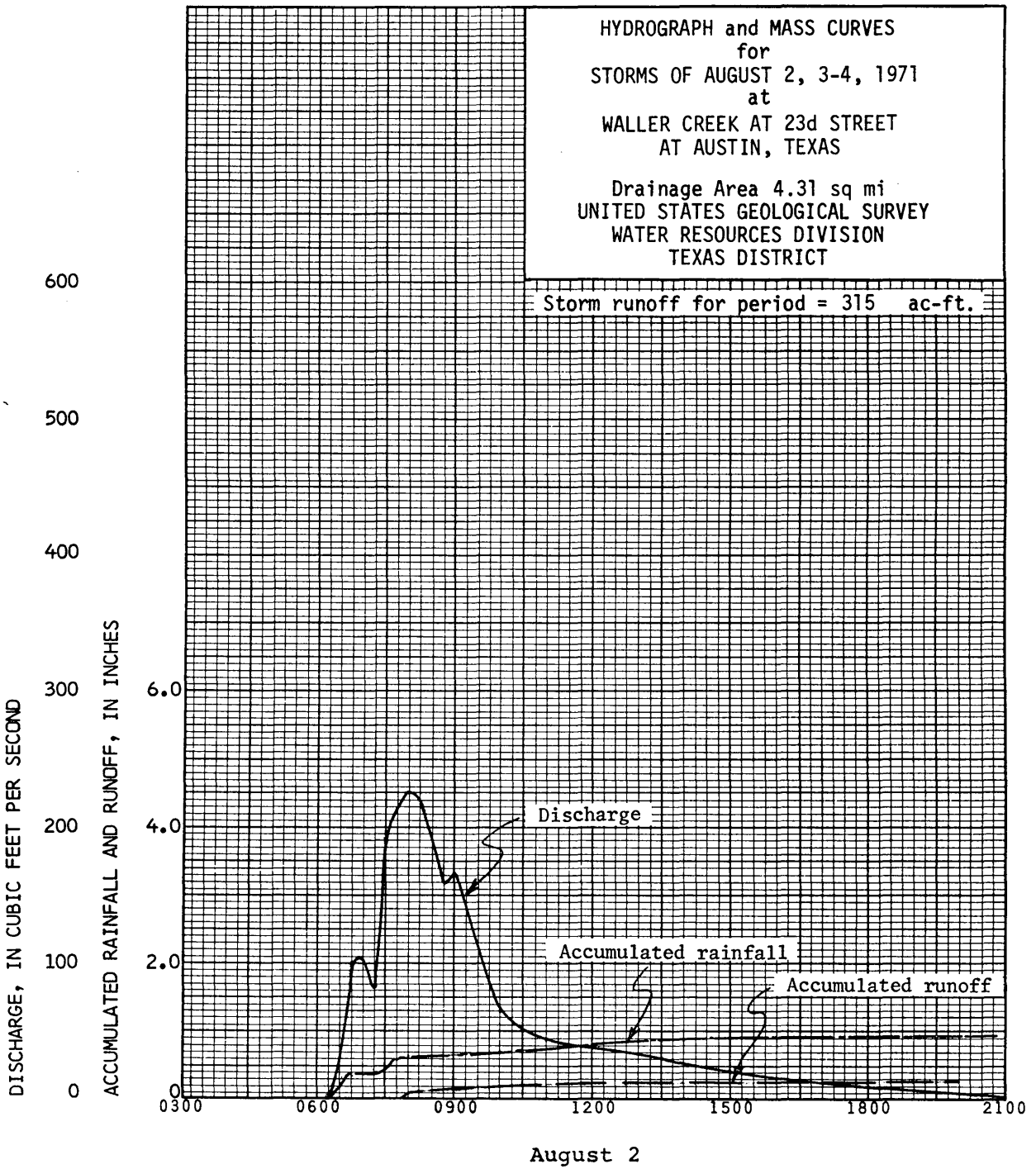
Sheet 4 of 4
Comp. by: FHT
Date 12/14/71
Check by EEW
Date 2/15/72

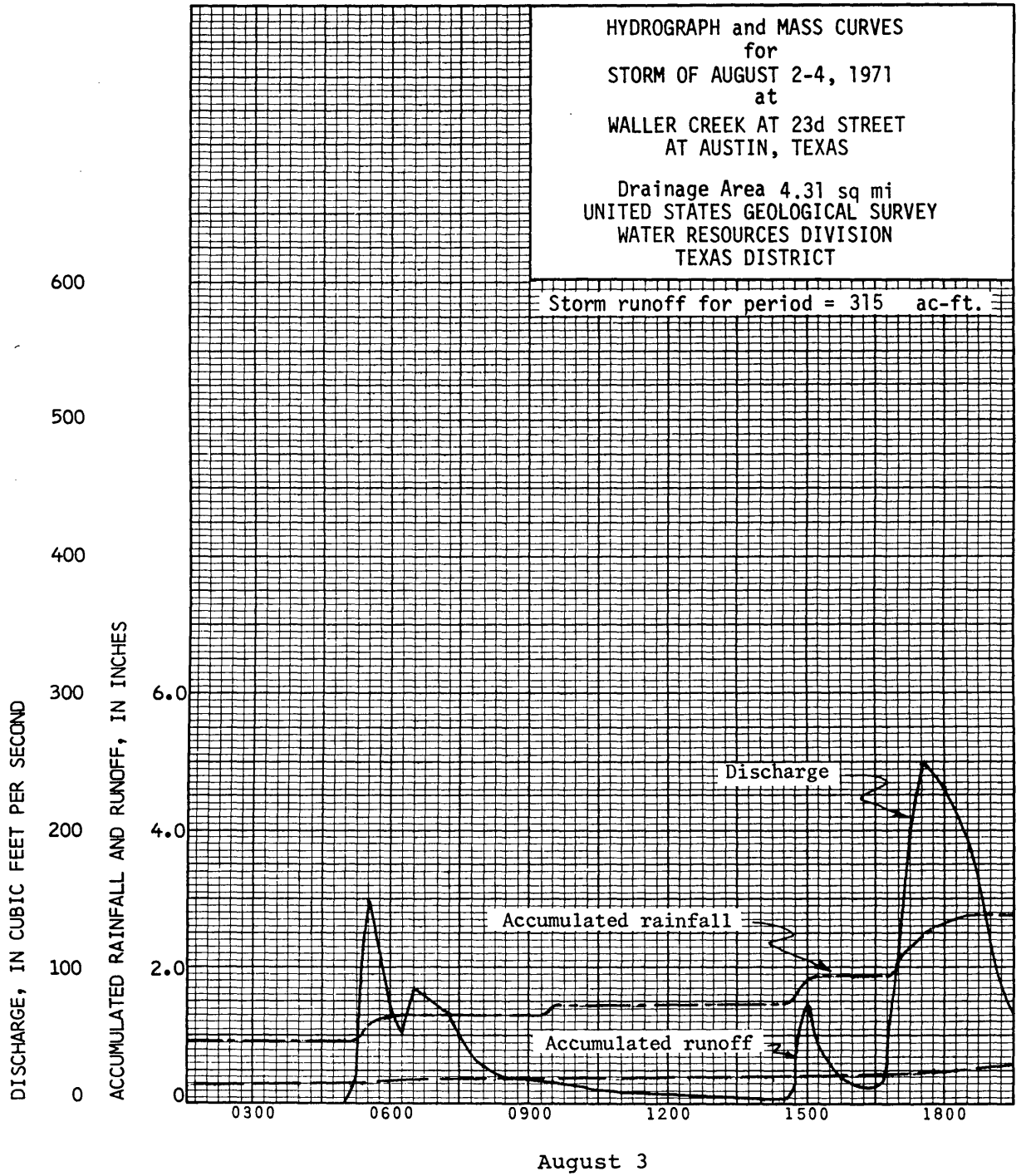
Study Area WALLER CREEK at 23rd ST., AUSTIN, Tex. Date of storm Aug 2-4, 1971

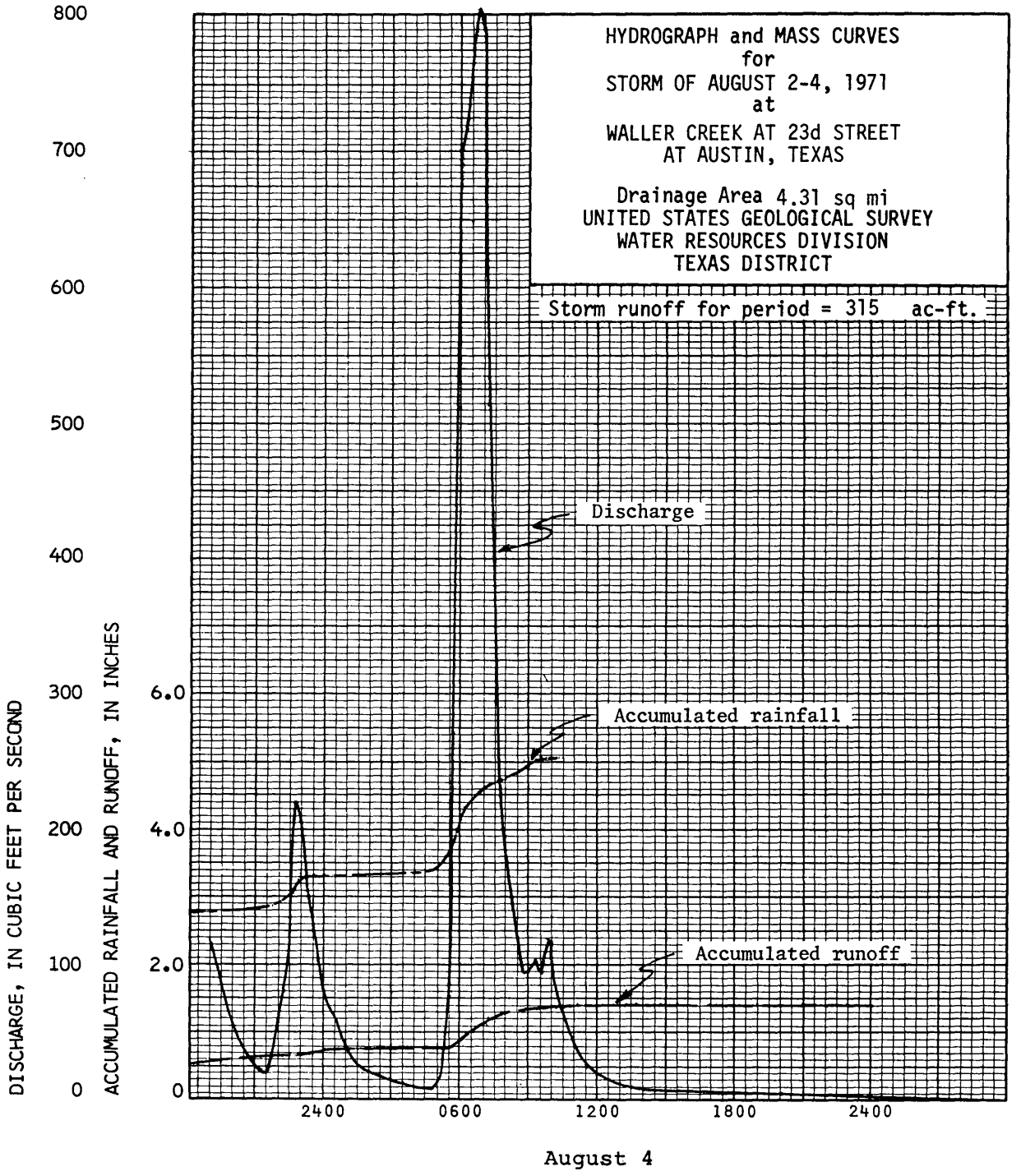
	Accumulated Precipitation in Inches for Recording Rain Gages												Accumulated Weighted Precipitation	
Weight Factor	.508		.396		.096									
Date & Time	Gage 4-R Recorded	x Factor	Gage 5-R Recorded	x Factor	Gage 6-R Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	Gage Recorded	x Factor	Recording Gages All Gages	(Rec. Gages x K) All Gages
Aug 4, 1971														
0445	3.36	1.71	2.80	1.11	2.60	.25							3.07	3.40
55	3.37	1.71	2.85	1.13	2.60	.25							3.09	3.42
0500	3.38	1.72	2.90	1.15	2.61	.26							3.12	3.45
15	3.50	1.78	2.95	1.17	2.62	.25							3.20	3.54
30	3.58	1.82	2.96	1.17	2.92	.28							3.27	3.62
45	3.60	1.83	3.25	1.29	3.38	.32							3.44	3.81
50	3.65	1.85	3.27	1.29	3.52	.34							3.48	3.85
55	3.90	1.98	3.40	1.35	3.60	.35							3.68	4.07
0600	4.00	2.03	3.52	1.39	3.64	.35							3.77	4.17
05	4.07	2.07	3.58	1.42	3.64	.35							3.84	4.25
10	4.15	2.11	3.60	1.43	3.70	.36							3.90	4.32
15	4.25	2.16	3.62	1.43	3.75	.36							3.95	4.37
30	4.35	2.21	3.69	1.44	3.85	.37							4.04	4.47
45	4.40	2.24	3.77	1.49	3.95	.38							4.11	4.55
0700	4.47	2.27	3.85	1.52	4.03	.39							4.18	4.63
15	4.50	2.29	3.90	1.54	4.05	.39							4.22	4.67
30	4.53	2.30	3.95	1.56	4.10	.39							4.25	4.70
45	4.54	2.31	3.99	1.58	4.15	.40							4.29	4.75
0800	4.56	2.32	4.01	1.59	4.15	.40							4.31	4.77
30	4.62	2.35	4.05	1.60	4.25	.41							4.36	4.83
0900	4.75	2.41	4.10	1.62	4.25	.41							4.44	4.92
15	4.92	2.50	4.11	1.63	4.30	.41							4.54	5.03
30	4.98	2.54	4.12	1.63	4.30	.41							4.58	5.07
1000	4.98	2.54	4.14	1.64	4.30	.41							4.59	5.08

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
1-S	.264	5.50	1.45								
2-S	.101	4.17	.42								
3-S	.190	6.42	1.22								
4-R	.161	4.98	.80								
5-R	.187	4.14	.77								
6-R	.097	4.30	.42							WMR:	5.08

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation = 5.08/4.59 = 1.107


HYDROGRAPH and MASS CURVES
for
STORMS OF AUGUST 2, 3-4, 1971
at
WALLER CREEK AT 23d STREET
AT AUSTIN, TEXAS
Drainage Area 4.31 sq mi
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT
Storm runoff for period = 315 ac-ft.
DISCHARGE, IN CUBIC FEET PER SECOND
ACCUMULATED RAINFALL AND RUNOFF, IN INCHES
600
500
400
300
200
100
0
6.0
4.0
2.0
0
Discharge
Accumulated rainfall
Accumulated runoff
0300
0600
0900
1200
1500
1800
2100
August 2


HYDROGRAPH and MASS CURVES
for
STORM OF AUGUST 2-4, 1971
at
WALLER CREEK AT 23d STREET
AT AUSTIN, TEXAS
Drainage Area 4.31 sq mi
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT
Storm runoff for period = 315 ac-ft.
DISCHARGE, IN CUBIC FEET PER SECOND
ACCUMULATED RAINFALL AND RUNOFF, IN INCHES
600
500
400
300
200
100
0
6.0
4.0
2.0
0
Discharge
Accumulated rainfall
Accumulated runoff
0300
0600
0900
1200
1500
1800
August 3


HYDROGRAPH and MASS CURVES
for
STORM OF AUGUST 2-4, 1971
at
WALLER CREEK AT 23d STREET
AT AUSTIN, TEXAS
Drainage Area 4.31 sq mi
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT
Storm runoff for period = 315 ac-ft.
Discharge
Accumulated rainfall
Accumulated runoff
DISCHARGE, IN CUBIC FEET PER SECOND
ACCUMULATED RAINFALL AND RUNOFF, IN INCHES
800
700
600
500
400
300
200
100
0
6.0
4.0
2.0
0
2400
0600
1200
1800
2400
August 4

TX-65(Rev.7-69)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station Wilbarger Creek Near Pflugerville, Texas

Period of Record Oct. 22-24, 1970 Drainage Area 4.61

Time	G. Ht. Feet	Sh. Adj.	Discharge C.f.s.	Discharge Inc.	Discharge In/Hr	Runoff Inches	Runoff Acc. In.
Oct. 22, 1970							
0000	.87	0	.04	84	.0000	.0000	.0000
2100	.87		.04	85	.0000	.0000	.0000
15	.89		.06	2	.0000	.0000	.0000
30	1.07		.88		.0003	.0001	.0001
45	1.63		22		.0074	.0018	.0019
2200	1.76		33		.0111	.0028	.0047
15	1.71		28		.0094	.0024	.0071
30	1.61		20		.0067	.0017	.0088
45	1.53		15		.0050	.0012	.0100
2300	1.47		12		.0040	.0010	.0110
15	1.42		9.9		.0033	.0008	.0118
30	1.41		9.5		.0032	.0008	.0126
45	1.49		13	2	.0044	.0011	.0137
2400	1.50	0	14	1	.0047	.0006	.0143
Oct. 23, 1970							
0000	1.50	0	14	1	.0047	.0006	.0149
15	1.52		15	2	.0050	.0012	.0161
30	1.73		30		.0101	.0025	.0186
45	1.89		47	2	.0158	.0040	.0226
0100	1.96		56	3	.0188	.0070	.0296
30	1.92		51	4	.0171	.0086	.0382
0200	1.77		34		.0114	.0057	.0439
30	1.63		22		.0074	.0037	.0476
0300	1.55		16		.0054	.0027	.0503
30	1.47		12	4	.0040	.0020	.0523
0400	1.41		9.5	6	.0032	.0024	.0547
0500	1.32	0	6.0	8	.0020	.0020	.0567
0600	1.25	0	4.0	8	.0013	.0013	.0580
0700	1.20		2.9		.0010	.0010	.0590
0800	1.16		2.2		.0007	.0007	.0597
0900	1.12		1.5		.0005	.0005	.0602
1000	1.10		1.2	8	.0004	.0004	.0606
1100	1.07		.88	5	.0003	.0002	.0608
15	1.51		14	2	.0047	.0012	.0620
30	1.78		35		.0118	.0029	.0649
45	2.11		78		.0262	.0066	.0715
1200	2.52		144		.0484	.0121	.0836
15	2.42		126		.0423	.0106	.0942
30	3.22		289		.0971	.0243	.1185
45	4.10		507		.1704	.0426	.1611
1300	4.42		611		.2053	.0513	.2124
15	4.28		563		.1892	.0473	.2597
30	4.13		516		.1734	.0434	.3031
45	3.84		438		.1472	.0368	.3399
1400	3.50		354		.1189	.0297	.3696
15	3.21		286		.0961	.0240	.3936
30	2.94		227		.0763	.0191	.4127
45	2.73		183		.0615	.0154	.4281
1500	2.54		147		.0494	.0124	.4405
15	2.37		118		.0396	.0099	.4504
30	2.23		96		.0323	.0081	.4585
45	2.14		82		.0276	.0069	.4654
1600	2.04		67		.0225	.0056	.4710
15	1.99		60		.0202	.0050	.4760
30	1.92	0	51	2	.0171	.0043	.4803

Computed by B.T. B.III Date 6-10-71 Checked by EEW Date 11-22-71

TX.-65 (Rev. 7-69)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station Wilbarger Creek near Pflugerville, Texas

Period of Record Oct. 22-24, 1970 Drainage Area 4.61

Time	G. Ht. Feet	Sh. Adj.	Discharge C. f. s.	Discharge Inc.	Discharge In/Hr	Runoff Inches	Runoff Acc. In.
Oct. 23, 1970 (continued)							
1645	1.83	0	40	2	.0134	.0034	4837
1700	1.78		35	3	.0118	.0044	.4881
30	1.69		26	4	.0087	.0044	.4925
1800	1.63		22		.0074	.0037	.4962
30	1.57		18		.0060	.0030	.4992
1900	1.52		15		.0050	.0025	.5017
30	1.47		12	4	.0040	.0020	.5037
2000	1.44		11	6	.0037	.0028	.5065
2100	1.38		8.3	8	.0028	.0028	.5093
2200	1.33		6.4		.0022	.0022	.5115
2300	1.30		5.4	8	.0018	.0018	.5133
2400	1.28	0	4.8	4	.0016	.0008	.5141
Oct. 24, 1970							
0000	1.28	0	4.8	12	.0016	.0024	.5165
0300	1.21		3.1	24	.0010	.0030	.5195
0600	1.18		2.6	36	.0009	.0032	.5227
1200	1.14		1.8	72	.0006	.0054	.5281
2400	1.09	0	1.1	48	.0004	.0024	.5305

Time	G. Ht. Feet	Sh. Adj.	Discharge C.f.s.	Discharge Inc.	Discharge In/Hr.	Runoff Inches	Runoff Acc. In

Computed by B.T.B.III Date 6-10-71 Checked by EEW Date 11-22-71

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

Sheet 1 of 2
Comp. by: BTB III
Date 6-14-71
Check by EEW
Date 11-23-71

Study Area WILBARGER CREEK near PEASLERVILLE, TEX. Date of storm Oct. 22-23, 1971

Accumulated Precipitation in Inches for Recording Rain Gages													Accumulated Weighted Precipitation	
Weight Factor	.431		.301		.268									
	Gage 1-R		Gage 2-R		Gage 3-R		Gage		Gage		Gage		Recording Gages	(Rec. Gages x K)
Date & Time	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	All Gages	All Gages
Oct. 22, 1971														
2100	0	0	0	0	0	0								0
15	.13	.06	0	0	.20	.05								.11
30	.73	.31	.39	.12	.60	.16								.59
45	1.43	.62	1.00	.30	1.63	.44								1.36
2200	1.48	.64	1.46	.44	1.75	.47								1.55
15	1.49	.64	1.54	.46	1.77	.47								1.57
30	1.51	.65	1.55	.47	1.79	.48								1.60
45	1.62	.70	1.59	.48	1.80	.48								1.66
2300	1.64	.71	1.64	.49	1.84	.49								1.69
15	1.66	.72	1.66	.50	1.85	.50								1.72
30	1.67	.72	1.69	.51	1.86	.50								1.73
45	1.68	.72	1.72	.52	1.89	.51								1.75
2400	1.70	.73	1.73	.52	1.91	.51								1.76
Oct. 23, 1971														
0100	1.71	.74	1.74	.52	1.93	.52								1.78
0400	1.72	.74	1.76	.53	1.96	.53								1.80
1045														1.80
1100														1.93
15														2.66
30														3.06
45														3.19
1200	See	Sheet	No. 2											3.24
15														3.27
30														3.27
45														3.27
1300														3.27

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
1-R	.431	1.72	.74
2-R	.301	1.76	.53
3-R	.268	1.96	.53

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor

WMR: 1.80

WMR = Sum of Precipitation x Weight Factor

K = WMR / Total Recording Gages Weighted Precipitation = 1.80 / 1.80 = 1.000

TX-78 (Revised July 1969)

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPITATION RECORD

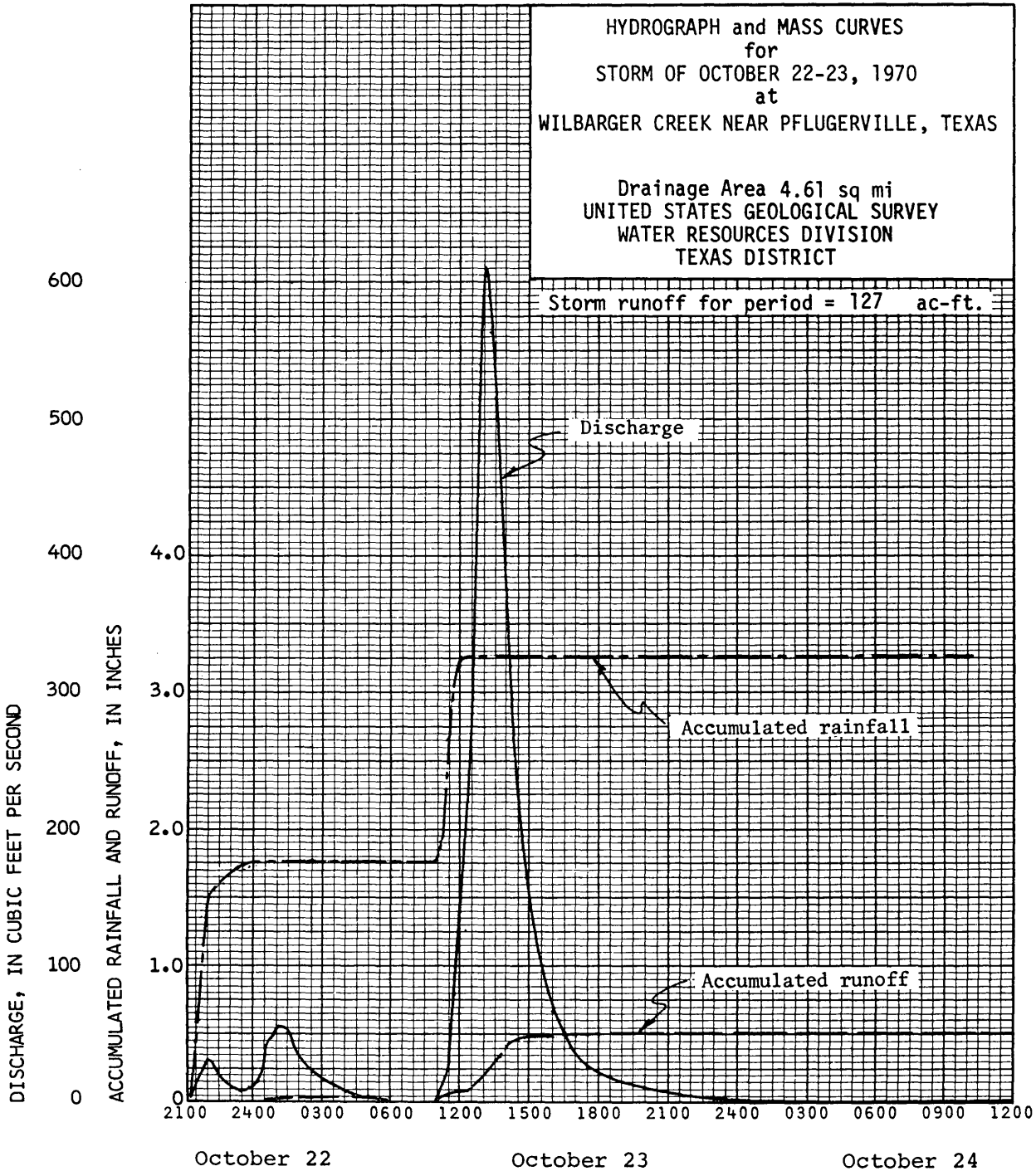
Sheet 2 of 2
Comp. by: B.T.B III
Date 6-14-71
Check by EEW
Date 11-23-71

Study Area WILBARGER CREEK NEAR PFLUGERVILLE, TEXAS Date of storm OCT 23, 1971

	Accumulated Precipitation in Inches for Recording Rain Gages												Accumulated Weighted Precipitation	
Weight Factor	.431		.301		.268									
	Gage 1-R		Gage 2-R		Gage 3-R		Gage		Gage		Gage		Recording Gages All Gages	(Rec. Gages x K) All Gages
Date & Time	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor		
OCT 23														
10 45	0	0	0	0	0	0								0
11 00	.02	.01	0	0	.45	.12								.13
15	.89	.38	.48	.14	1.28	.34								.86
30	1.31	.56	1.04	.31	1.44	.39								1.26
45	1.42	.61	1.25	.38	1.49	.40								1.39
12 00	1.49	.64	1.31	.39	1.54	.41								1.44
15	1.50	.65	1.32	.40	1.55	.42								1.47
30	1.51	.65	1.32	.40	1.56	.42								1.47
45	1.51	.65	1.33	.40	1.57	.42								1.47
13 00	1.51	.65	1.34	.40	1.58	.42								1.47

Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor	Rain Gage	Weight Factor	Precipitation	Precipitation x Weight Factor
1-R	.431	1.51	.65								
2-R	.301	1.34	.40								
3-R	.268	1.58	.42								
										WMR:	1.47

WMR = Sum of Precipitation x Weight Factor K = WMR / Total Recording Gages Weighted Precipitation = 1.47/1.47 = 1.000


HYDROGRAPH and MASS CURVES
for
STORM OF OCTOBER 22-23, 1970
at
WILBARGER CREEK NEAR PFLUGERVILLE, TEXAS
Drainage Area 4.61 sq mi
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT
Storm runoff for period = 127 ac-ft.
Discharge
Accumulated rainfall
Accumulated runoff
DISCHARGE, IN CUBIC FEET PER SECOND
ACCUMULATED RAINFALL AND RUNOFF, IN INCHES
600
500
400
300
200
100
0
4.0
3.0
2.0
1.0
0
2100
2400
0300
0600
1200
1500
1800
2100
2400
0300
0600
0900
1200
October 22
October 23
October 24